"ADP MASTER PLAN

Volume I

January, 1983 "

Richard D. Lamm, Governor

R. Garrett Mitchell, Executive Director

Department of Administration

STATE OF COLORADO

DEPARTMENT OF ADMINISTRATION
1525 Sherman Street, 7th Floor
Denver, Colorado 80203
Phone (303) 866-3221

December 1, 1982

Richard D. Lamm
Governor

R. Garrett Mitchell
Executive Director

A. Y. Levine
Deputy Director

The Honorable Richard D. Lamm
Governor, State of Colorado
State Capitol Building
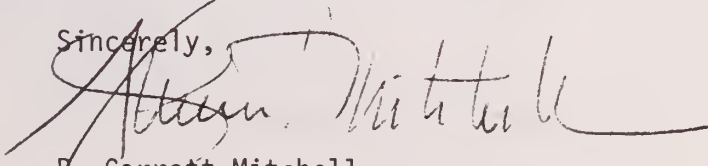Denver, Colorado 80203

Dear Governor Lamm:

Attached please find a copy of the 1983 Automated Data Processing (ADP) Master Plan for the State of Colorado.

The 1983 ADP Master Plan was prepared by the Division of ADP in accordance with CRS 24-30-613. It contains the managed growth approach to ADP which began in 1977 for improving the data processing services to all State users, and at the same time take advantage of the cost effectiveness related to large scale computer facilities.

The 1983 ADP Master Plan is published in two volumes. Volume I addresses the need to properly plan for ADP needs by identifying and providing cost/benefit information for planned new or revised applications and the cost of maintaining existing applications. Volume I also summarizes the overall status of ADP in Colorado and identifies planning objectives for fiscal year 1983-84. Volume II contains the 1983-84 budget analysis.
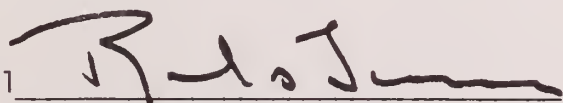
I ask your endorsement of the 1983 ADP Master Plan and request your permission to continue implementation of the planning objectives.

Sincerely,

R. Garrett Mitchell
Executive Director

Attachments

Governor's Approval _____
Richard D. Lamm, Governor

Date __1/27/83__

STATE OF COLORADO

Garrett Mitchell
Executive Director
Department of Administration
7th Floor - State Services Building
1525 Sherman Street
Denver, Colorado 80203

Dear Mr. Mitchell:

The 1983 Automated Data Processing Master Plan for the State of
Colorado (two volumes) was prepared by the Division of ADP for your
approval in accordance with CRS 24-30-603.

The 1983-84 Master Plan stresses the importance of the planning
process for agencies on an application level and the need to monitor the
viability of existing applications. It continues to support a managed
growth approach towards the development and use of State computer centers,
the development of distributed data processing networks, and office auto-
mation, when cost effective. It is a strategy for the near term that
directly relates to the statewide budget requirements for FY 1983-84.

Sincerely,

Robert J. Miller
Director
Division of Automated Data Processing

RJM/jv

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3. ADP MASTER PLANS, 1972, 1973, 1974, 1977, 1978, 1979, 1980, 1981, and 1982

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5. GENERAL GOVERNMENT COMPUTER CENTER CAPACITY/USAGE STUDY, 1982

SECTION I

SUMMARY

SUMMARY

Data processing is changing rapidly, and keeping up with the changes is difficult. In this year's ADP Master Plan, the progress and problems of previous years have been reviewed in Section II as prologue to the future, in order that we might profit from our past experience.

Over the last five years, Colorado has maintained a level of expenditures for data processing between 1.7% and 2.0% of the State's operating budget as reflected in the Long Bill Appropriation. (See Exhibit I-A) When compared to the total State expenditures as contained in the State's COMPREHENSIVE ANNUAL FINANCIAL REPORT, the percentage is even lower, ranging from 1.2% to 1.4%. (See Exhibit I-B)

During the last five years the number of Full Time Equivalent (FTE) employees for data processing has risen from 1,029.89 in 1977-78 to 1,032.73 in 1981-82. This represents between 2.1% and 3.0% of the total State FTE.

The bottom line is that the portion of State resources going toward data processing has been fairly constant, but major changes in systems and equipment have been made. This is what is meant by planned growth -- progress within available resources.

This plan builds upon the past plans, and Section II, Background and Overview, contains the ongoing planning objectives which continue to be valid guidelines for the future.

Problems with the planning process itself, and recommendations for dealing with them are an important part of this plan. All State agencies need to do a better job of long-range strategic planning.

Plans need to be sound. They need to be funded. They need to be implemented. Funding to support new and existing applications must be provided. Applications must be periodically reviewed, and either replaced or scrapped when they no longer serve their intended purpose.

Applications will be monitored and reviewed in the future, starting with their inception and at each major enhancement, using the Application Software Request procedure. (See Appendix C) Old, high usage applications will be selected for evaluation as part of an ongoing usage/capacity planning program.

EXHIBIT I-A

ADP EXPENDITURES

AS A PERCENT OF

LONG BILL APPROPRIATION

	ADP FTE	ADP Expenditure	Long Bill Appropriation (Excl. Cap. Cons.)	Percent
1977-78	1.029.89	$29,644,589	$1,634,468,995	2.0
1978-79	1,018.65	33,090,330	1,829,251,942	1.8
1979-80	1,022.17	41,470,617	2,101,739,293	2.0
1980-81	1,059.89	41,868,872	2,483,532,373	1.7
1981-82	1,032.73	45,467,082	2,761,345,999	1.6

EXHIBIT I-B

ADP EXPENDITURES
COMPARED TO TOTAL STATE EXPENDITURES

	1977-78	1978-79	1979-80	1980-81	1981-82
Total State Expenditures (000,000)	2458.4	2654.3	2992.7	3303.8	3477.3
Total ADP Expenditures (000,000)	29.6	33.1	41.5	41.9	45.5
ADP% of Total State Expend.	1.2%	1.2%	1.4%	1.3%	1.3%
Total State Expend. (Constant $ 1972) (000,000)	1683.8	1691.7	1762.5	1789.7	1735.2
Total ADP Expend. (Constant $ 1972) (000,000)	20.3	21.1	24.4	22.7	22.7
Per Capita State Expend.	933	977	1072	1109	1141
Per Capita ADP Expend.	11.23	12.18	14.87	14.06	14.93
Per Capita State Expend. (Constant $ 1972)	639	623	631	601	569
Per Capita ADP Expend. (Constant $ 1972)	7.69	7.77	8.75	7.62	7.45
Total Statewide FTE (000)	36.1	36.3	36.4	36.9	36.0
Total ADP FTE (000)	1.0	1.0	1.0	1.1	1.0
ADP % of Total FTE	2.8	2.8	2.7	3.0	2.8

The main thrust of this year's ADP MASTER PLAN, however, is not in Section II, Background and Overview, nor is it in the recommendations themselves, for they merely address the specific details. The main thrust lies in the INTENT, THE LONG RANGE GOALS. Where should Colorado be headed?

GOAL I - SYSTEM INTEGRATION

As a practical matter, complete integration will probably never be achieved. The goal, however, is valid. Subject to the requirements for data security and individual requirements, information should be freely accessible and available to all those who need it. It should be available quickly, in whatever form or media required. The technical barriers to this are rapidly disappearing, and soon the major barrier will be the apathy and inertia of people. But that is changing too, as the personal computers expose more people to the power and potential of automation.

What are the characteristics of integrated systems? What will it be like if this goal becomes a reality?

1. Networks

Information will pass from one point to another electronically, and not by paper. Local area networks will tie the offices together, and major networks will tie computer centers together. The employee will be able to use any facilities to which he is privileged, regardless of location. Combination terminal and office automation equipment will be available to interface with the networks. Standard network protocols and hardware now being developed will make it possible

The objectives that the State needs to achieve in this area are:

a. Standard Local Area Networks
b. State Data Communication Networks connecting major data centers.
c. Standard equipment and software interfaces.

2. Common Systems and Procedures

Passing information is no good if the person receiving it cannot handle it. The basic data elements and data base structures must be uniform throughout the State. Recorded data for personnel, payroll, accounting, budgeting, and similar universal systems need to be standardized.

3. <u>Multimedia Systems</u>

Systems will need to cross previous boundaries, with voice, data, graphics, images and hard copy (paper) all available.

GOAL 2 - PAPER REDUCTION

The "paperless office" comes closer to reality as systems become standardized and integrated. Some paper will always be required, but easy access to electronic files and the ease of handling that information can elminate much of it. That does not even consider the savings of time spent "filing" and "searching files" by hand.

GOAL 3 - OFFICE AUTOMATION

In the broadest sense, this means placing computing power in the hand of everyone who needs it. For example:

1. <u>Secretary</u> - Word processing, electronic mail, filing, scheduling, voice telephone, etc.

2. <u>Clerk</u> - Calculator, data entry and retrieval, report generation, computer terminal operation, transaction processing, etc.

3. <u>Professional</u> - Computer access, special data processing applications, business graphics, statistical packages, etc.

To some extent the emergence of the microcomputer or personal computer will be available to almost anyone. It will have a universal impact on future developments. Every effort will be made to take advantage of this tool, and make useful software available to all through central cataloging and common libraries. The Division of ADP intends to promote the intelligent development of the use of this tool, and provide guidance in its use.

GOAL 4 - EDUCATION

The computer is here to stay. It is fast permeating everyones life. The colleges and universities, and even the elementary and secondary schools are hard pressed to keep up with the demand. A major objective must be to assist all State educational institutions to keep on the leading edge of technology. The basics of this field are needed by all students. For those who would pursue professional careers requiring specialized computing knowledge, that knowledge should be available to them. If it is not, the educational programs simply will not be adequate for tomorrow's needs.

With these goals in mind, the specific recommendations on the following pages may seem far removed from the goals. Rather they should be put in perspective, as the first steps in their achievement.

The recommendations for fiscal year 1983-84 are listed below. For more detail, please refer to Section IV.

A. PLANNING AND BUDGETING

RECOMMENDATION A-1

ALL DEPARTMENTS, INSTITUTIONS, AND AGENCIES SHOULD FURNISH LONG-RANGE PLANS TO THE DIVISION OF ADP BY APRIL 1 OF EACH YEAR, OR A STATUS REPORT ON PROGRESS IN IMPLEMENTING THE STILL CURRENT PLAN.

RECOMMENDATION A-2

ALL DEPARTMENTS, INSTITUTIONS, AND AGENCIES SHOULD FURNISH SHORT-RANGE (CURRENT AND BUDGET REQUEST YEAR) PLANS TO THE DIVISION OF ADP BY AUGUST 1 OF EACH YEAR. THESE SHOULD INCLUDE UPDATED SPENDING PLANS ACCORDING TO THE CURRENT YEAR'S APPROPRIATION, AND PRIORITIES AND JUSTIFICATION FOR NEW SPENDING ITEMS PLANNED FOR THE BUDGET REQUEST YEAR.

RECOMMENDATION A-3

CREATE A TASK FORCE COMPOSED OF MEMBERS FROM THE DIFFERENT BRANCHES AND HIGHER EDUCATION TO REVIEW THE CURRENT PROCESS, STUDY ALTERNATIVE WAYS TO SIMPLIFY THE STATE BUDGET PROCESS, AND RECOMMEND SELECTION OF A SINGLE SYSTEM.

B. COMPUTER FACILITIES

RECOMMENDATION B-1

CONTINUE DEVELOPMENT OF THE FINANCIAL MANAGEMENT COMPUTER CENTER AT THE DEPARTMENT OF REVENUE.

RECOMMENDATION B-2

AVOID CREATION OF MEDIUM SIZED COMPUTER CENTERS AND RELY ON LARGE CENTERS AND COMMUNICATIONS.

RECOMMENDATION B-3

ENCOURAGE THE USE OF MICROCOMPUTERS IN CONTROLLED ACCESS
ENVIRONMENTS, SUBJECT TO APPROPRIATE SECURITY MEASURES, AS
THE BEST WAY TO DEVELOP EXPERIENCE IN THE USES OF THIS DATA
PROCESSING TOOL.

C.   DATA COMMUNICATIONS

RECOMMENDATION C-1

EXPAND THE DATA CIRCUITS ON THE STATE MICROWAVE NETWORK WHERE-
EVER THIS IS MORE COST EFFECTIVE THAN BELL FACILITIES.

RECOMMENDATION C-2

THE DIVISION OF ADP AND THE DIVISION OF COMMUNICATIONS SHOULD
CONTINUE TO PLAN FOR A STATEWIDE COMMUNICATIONS NETWORK TO
SUPPORT DATA, VOICE, IMAGE, AND FUTURE TECHNOLOGY.

D.   INFORMATION MANAGEMENT

RECOMMENDATION D-1

ESTABLISH AN INFORMATION MANAGEMENT TASK FORCE TO DEVELOP A
CONCEPTUAL DESIGN AND RATIONALE FOR DATA BASE ELEMENTS AND
STRUCTURES NEEDED TO SUPPORT COMMON MANAGEMENT DECISION-
MAKING AT DEPARTMENTAL AND STATEWIDE LEVELS.

RECOMMENDATION D-2

CONDUCT A FEASIBILITY STUDY AND COST/BENEFIT ANALYSIS OF
MODIFYING HEFAS FOR USE BY EXECUTIVE DEPARTMENTS.

E.   PERFORMANCE EVALUATION

RECOMMENDATION E-1

COMPUTER CENTERS, WITH THE HELP OF THEIR USERS, SHOULD PERIODI-
CALLY CONDUCT SELF-EVALUATIONS TO DETERMINE THE ADEQUACY AND
USERS SATISFACTION OF THE SERVICES PROVIDED, AND ASSURE THAT THE
CENTER IS IN COMPLIANCE WITH STATE STANDARDS AND ANY POLICIES
AND STANDARDS SET FOR THE COMPUTER. SELF-EVALUATIONS SHOULD BE
SCHEDULED IN THE CENTER'S PLAN, AND REPORTS OF THE RESULTS FILED
WITH THE DIVISION OF ADP.

RECOMMENDATION E-2

EACH COMPUTER CENTER SHOULD INCLUDE IN ITS PLAN THE REQUIRE-
MENTS TO STAFF AND FUND AN ON-GOING PROGRAM TO MONITOR RESOURCE
UTILIZATION BY USER APPLICATION.

RECOMMENDATION E-3

EACH COMPUTER CENTER SHOULD SUBMIT TO THE DIVISION OF ADP
ALONG WITH THEIR SHORT-RANGE PLAN AND BUDGET REQUEST, A LIST
OF FIVE HIGH-USAGE APPLICATIONS SUGGESTED FOR THE DIVISION OF
ADP TO EVALUATE.

F. PERSONNEL

RECOMMENDATION F-1

DEVELOP REQUIREMENTS FOR A DATA COMMUNICATIONS SPECIALIST
CLASSIFICATION AND SEEK THE ESTABLISHMENT OF SUCH A CLASSI-
FICATION FROM THE DEPARTMENT OF PERSONNEL.

G. HIGHER EDUCATION

RECOMMENDATION G-1

ENCOURAGE SMALL INSTITUTIONS OF HIGHER EDUCATION TO SEEK
COOPERATION AND DEVELOP COORDINATED PROGRAMS OF INSTRUCTION
WITH LARGER INSTITUTIONS TO IMPROVE QUALITY AND MINIMIZE
DUPLICATED FACILITIES.

RECOMMENDATION G-2

CREATE A TASK FORCE TO STUDY THE NEEDS OF CCD, MSC, AND UCD
AT AURARIA, AND MAKE RECOMMENDATIONS CONCERNING THE CREATION
OF AN AURARIA COMPUTER CENTER.

SECTION II

BACKGROUND AND OVERVIEW

Preface

The ADP Master Plan has played an important role in setting the direction of data processing in the State for many years. The plan itself, and special task force studies in conjunction with it, have focused on timely issues and led to planned progress in the ADP capabilities of the State. At the same time, the level of expenditures for ADP purposes has remained relatively steady as a percent of total State operating costs.

The persistent tendency has been to focus on the immediate future, the crisis of the moment. The comment, "How can I plan when I don't know yet what the appropriation for next year will be," typifies this attitude. The result has been that agency long-range planning beyond the next fiscal year has been weak or inconsistent.

Compensating for this, the Division of ADP has consistently applied guidelines based on overall planning objectives that have remained fairly stable over the years. Through the process of reviewing plans, recommending funding, and approving acquisition of ADP equipment, applications, and services, these guidelines have increased ADP capabilities and improved services to the users.

For many managers, planning is still not a proven tool. For them planning is short-range and crisis driven. Nobody likes to expend scarce resources developing a plan that will sit on a shelf and gather dust, especially when urgent and important systems are demanding attention. Yet, good long-range planning is important. Why is it that there is never enough time to do it right, but there is always enough time to do it over?

For these reasons the 1983 ADP Master Plan is different from the usual structure. This section has been expanded to include:

A. The Planning Process - An analysis of the existing structure and problems of the planning and budgeting cycle are presented here. The concept of strategic planning and a planning model are offered as a guide to better long-range planning.

B. Administering the Plan - An analysis of the authority, organization, policy and procedures of the Division of ADP are presented here. It is hoped that this will help the reader to understand how the Division of ADP is working with other State agencies to meet its statutory responsibilities.

1983 STATE OF COLORADO ADP MASTER PLAN

C. <u>1982 Planning Objectives</u> - A status report on the recommenda-
tions contained in the 1982 ADP Master Plan is presented here.

D. <u>Status of Recommendations Prior to 1982</u> - This section recaps
the recommendations made in previous years that are still appli-
cable today, and explains some of the rationale behind them.

By looking at the process, the role of the Division of ADP, and
previous years' planning objectives, as well as just the 1982 planning objec-
tives, it is hoped that the reader will better understand exactly where we
are, and how we got here. The long range trends and implications for the
future should be a little easier to see. Our failures should indicate where
we need to concentrate our efforts, and our successes should encourage us to
plan more boldly.

The Division of ADP is interested in improving the ADP Master Plan
and the ADP Planning Process. In doing so, the Division of ADP has set back
the submission date for agency <u>short-range</u> plans (the current fiscal year
and budget request year) until August 1. This will provide time to analyze
the current year's appropriation and to prepare the budget request. The
Division of ADP will provide a new format for short-range plans by May 1, 1983.

If you have any comments or suggestions that you feel would help us
to improve the ADP Master Plan, send them to:

ADP Planning Coordinator
Division of Automated Data Processing
1575 Sherman Street, Room 110
Denver, Colorado 80203

A.   THE PLANNING PROCESS

Responsibility

The Director of ADP is responsible, by statute, for the develop-
ment and administration of the approved current and long-range ADP
plan. Once approved by the Governor, the plan represents the State
position on ADP and is directive in nature. Proper administration of
the plan is demonstrated by the accomplishment of planned events, and
progress toward planned goals and objectives, using available resources
to accomplish the intent of the plan.

Authority

The Director of ADP has the necessary statutory authority and
functions to meet his planning responsibilities. These include auth-
ority to: (1) review and approve the acquisition of data processing
equipment and facilities; (2) review ADP applications, planning,
systems, programs, personnel, equipment and facilities and establish
priorities; (3) require such reports from other agencies as may be
required.

Annual Cycle

Statewide planning is a continuous function of the Division of ADP with updates as needed. Revision to the plan, however, will normally be made annually as a complement to the planning and budget cycle. The annual cycle, in respect to the State ADP plan is pictured below:

APPROPRIATIONS

UPDATED
AGENCY ADP
PLANS

BUDGET
PROCESS

REVISED
DEPARTMENTAL
MASTER PLANS (AS
REQUESTED BY OSPB)

BUDGET
REQUESTS

REVISED
STATE ADP
PLAN
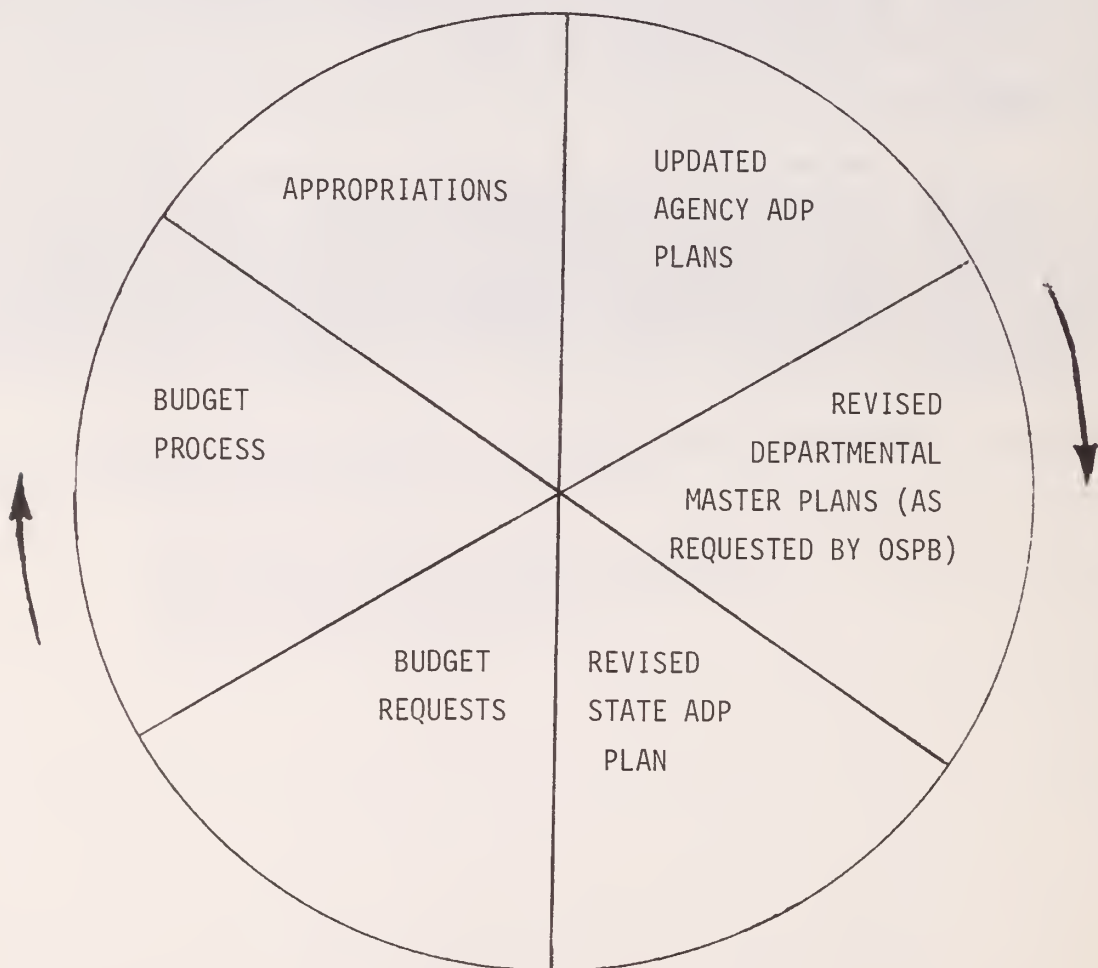
The ADP Budget

Currently each agency or institution is responsible for preparing its own budget. At the start of the annual cycle agencies submit their updated plans (based largely on appropriations received for the current year) to the Division of ADP for approval. Shortly after, they submit a list of priorities based upon their plan, and identify the costs of new requirements, which will be included in the upcoming budget request.

The priorities are reviewed by the Division of ADP and rated according to their importance and impact on the statewide plan. The result of this process is communicated to the Office of State Planning and Budgeting, where it is used to set the Governor's budget.

Computer centers, such as the General Government Computer Center, require the agency plans and priorities of their users in order to budget for their support. Agencies are required to submit annual plans by April 1st of each year, so that centers can estimate their support needs and prepare their updated plans and budgets by the new fiscal year.

After the budgets are given preliminary approval by OSP&B and the Governor, the agencies prepare their budgets for submission to the Legislature. The ADP budget is extracted and submitted to the Division of ADP using the Format 454, which provides a uniform reporting format for all agencies and institutions. An updated priority list is also submitted.

The summaries of the ADP budgets are published as the ADP BUDGET ANALYSIS volume of the State ADP Master Plan. The comments and statewide priorities are included to give guidance to the Joint Budget Committee, and assist the Legislature in its functions.

Problems with the Process

The process has some problems which need to be considered:

1. Fiscal Year Bias

2. Timing

3. Tracking

4. Evaluation of Progress

Fiscal year bias is planning only from year-to-year. Agencies which do a poor job of long-range planning are usually reluctant to provide a plan until the fiscal year budget is set. This is too late for computer centers and the Division of ADP to properly react. It is backward, in that the budget drives the plan, rather than the other way around.

A closely related problem is the timing of the plan update, April 1st of each year, which falls prior to the end of the legislative session when the appropriation has been passed. It is possible that by April 1st the Long Bill, which funds practically all of ADP has not come out of committee. Updated plans must make allowances or assumptions with regard to spending plans, which may later prove false. Most agencies opt for a late plan update. It should be noted that the better the long-range plan is, the less of a problem this is. Good long-range planning gives the Division of ADP, the Computing Centers, OSP&B, and the Legislature more to go on, and less chance of extreme shifts in direction or funding.

The tracking problem is tied to the fact that State agencies, institutions, and branches of government are all different. Consistency is hard to achieve. Tracking from year to year, across agencies, and through the budget process, is difficult.

Tracking through the budget process is more difficult for these reasons:

1. Different forms are used at different stages of the process.

   There are currently four basic sets of budget forms:

   1. Those used by OSP&B and the Governor to set overall budget guidelines.

   2. Those used by the Division of ADP (Format 454).

   3. Those used by Higher Education (only slightly different from DADP).

   4. Those used to submit the budget to the Legislature.

From time to time alternative budgeting methods have been tried, such as program planning and budgeting and zero-based budgeting. These have had their own forms.

2. <u>The appropriations process is inconsistent and information on what actions were taken is late and meager</u>.

When the final appropriations are made, there is no format similar to any of the above forms by which a comparison can be made to determine exactly what action was taken. The Long Bill Narrative prepared by the Joint Budget Committee accompanies the release of the Long Bill. The Appropriations Report, the Narrative's counterpart, is the Narrative updated to reflect the Long Bill as finally passed, and also includes special appropriation bills. It is usually available sometime in August.

3. <u>ADP plans are program/application oriented, while budgets are organization/object oriented</u>.

The Division of ADP has tried from the beginning to relate budget requests to applications and programs. There has always been the desire to provide plans and budgets useful at all levels of the planning and budgeting process. In the 1983-84 budget request submitted to the Legislature, a new attempt is being made to segregate the ADP budget items by programs using a new Schedule 12. The results will be evaluated to see if the Format 454 can be replaced with the Schedule 12. However, the budget forms and appropriations do not track to programs and applications. Funds are allocated to organizations by object class (Personal Services, Operating Expenses, Travel and Capital Outlay) and by various line items. Those elements (such as capital outlay, salary act, etc.) that are centrally appropriated make the task of tracking just that much harder.

Much of the tracking confusion could be eliminated if the various branches and agencies could establish a common base from which to perform their various functions. Unless and until the systems operate from a common base, there is always the risk that some important funding may fall through the cracks. In fact, this has sometimes happened.

The final problem, evaluation, is a serious attempt to evaluate the actual results against the planned results. Did the funding get spent as intended? Did the funding achieve the desired results? In most cases there is no way to determine these things accurately. If trying to determine these things is more costly than the value of the information, then it is of questionable value to try. It should be noted, however, that in the areas related to billing and reimbursement from Federal funds, being able to accurately track and evaluate programs can directly affect revenues.

Strategic Planning

Planning should be done at all levels of an organization, but often is not. Too many other tasks get in the way. Tactical planning, which is the level most frequently done, addresses immediate problems and certain critical projects. This is the area most managers deal with every day. In ADP it frequently involves the "when", "where", and "how" to acquire and deploy the resources necessary to meet the demands of an active and growing group of users.

By contrast strategic planning occurs at a high level in an organization, and is critical to the success of an organization. It is active, rather than passive, like forecasting or budgeting which estimate the future, rather than influence it. It assures the organization will be in a position to take advantage of the latest and best technology to meet requirements within the time frame of the plan. It ties the plan to the future directions of the organization, and defines the mission or purpose of the organization. The ADP plan must support the defined mission or purpose of the organization served.

Goals concern the fulfillment of broad organizational needs, the achievement of desired performance levels, or the alleviation of major problems. Specific objectives are established which will lead to achievement of the goals. These are well defined deliverables to be achieved during a given period. These are then reflected in the current budget.

Why Plan Strategically?

In a recent study on information resource planning by A.T. Kearney, management consulting firm, the benefits of planning became quite clear. Kearney noted that a large portion of a company's assets go to producing information, and the proportion is growing.

Interviews were conducted with presidents, vice-presidents of business planning, and vice presidents of management information systems from 40 of the nation's most successful companies.

The results were startling. Only eight percent of these "most successful" companies successfully managed the information resource so that other resources were made more productive.

The eight percent who did very well had strategic plans. They out-performed the others on the financial ratios (return on equity, return on total capital, and net profit margin) by 300 percent! They outper-formed those with no business or Information Systems (IS) plan by a factor of 10 to one. Even those with both business and IS plans, but whose plans were not integrated, were outperformed by six to one. Thus the rationale for integrated strategic planning comes through loud and clear. Other benefits besides financial benefits can also be derived from strategic planning.

Both the organization and the information systems group benefit from a unity derived from setting a common mission for the IS organization. This also results from greater communication and top management commitment. Here are listed some of the benefits or advantages that can be expected.

1. Identification of constraints on the organization and IS.

2. Improved project selection - based on organizational goals rather than individual or politically powerful user goals.

3. Better control of resources to maximize total benefits to the organization.

4. Improved confidence and morale that good management always generate.

5. Realization that IS is managing change, not just reacting to forced change.

6. Increased ability to measure effectiveness of information systems.

7. A well-defined approach to solving management control problems.

8.   Planning for future IS needs is based on the organization's priorities.

9.   Improved confidence in IS by top management.

Obviously, IS or ADP managers must become good planners, get into step with their organization, and identify with the organization's goals. With all these benefits, why isn't there more strategic planning?

What is Wrong with ADP Planning?

A lot of reasons exist for inadequate planning. Let us consider some of them:

1.   No Time - This reason fails to recognize the need to prioritize work. The most important tasks often do not yield immediate results. "The sooner that you sit at the terminal to key in a program, the longer it will take", is Henry Ledgard's rule for programmers. We need to recognize that same principle in ADP management.

2.   The Organization is too Dynamic - This very factor of constant change makes planning even more important. Changes should be seized as opportunities to take control. With proper effort changes can make things easier. Without planning, it is only a matter of time until the ADP manager is unable to respond to one of management's changes, and he will be finished.

3.   Blame the Users - Some say the user should do the planning. Others say they never know what the user wants. Why do we blame the poor user? The ADP manager should not ask "What can I do for you?" but rather say "Here's what I can do for you". Understanding organizational goals goes a long way in this direction. ADP managers should neither blame users for their own lack of planning nor let users plan for them.

4.   The Organization Has No Plan - Perhaps this is the best reason for ADP not planning, but it also offers the ADP manager a real opportunity. If he can convince top management of the need for strategic planning, both he and the organization will benefit.

Some strategic plans do not work. That may be because they are not strategic plans at all. Planning based on hardware acquisition, lead times, network plans, or physical space is tactical planning, not strategic.

There are perhaps four reasons why strategic plans are ineffective:

1. Lack of managerial involvement and support.

2. Failure to review plans.

3. Lack of planning directives and procedures.

4. Insufficient allocation of resources to planning.

There is perhaps one other reason that makes strategic planning difficult in government. That is the lack of cooperation and coordination between organizations which are largely autonomous, and which may have completely unrelated goals and objectives. It is suggested here that strategic planning, combined with the involvement of the very top levels of management, and the principle of checks and balances, can go a long way to eliminate this problem.

Managerial support is essential at the beginning, during the process, and as a follow-up. It is necessary to secure compliance from line managers who view the process as inimical to their best interests. Lack of managerial support and involvement can be fatal.

Managerial review is essential to assure that plans are not merely formulated and submitted, but are actually followed in a practical way in managerial decision making.

Carefully conceived policies and procedures delineate responsibilities, the scope of planning, the methodology employed, the planning cycle, review and control. Without such guidelines there can be little quality control over the final product.

Resources required will vary with the size and complexity of the organizations. More resources will be required to initiate the planning process, than will be required to maintain it once it has started.

There are four possible answers for the question of who will write the plan. At one time or other all four have been used by various State agencies. They are:

1. Task Force - A group of professionals from the operating units, working together, can often identify conflicts and provide incentives to establish an organization-wide perspective.

2. MIS Staff - When the ADP professionals write the plan there is danger of much inbreeding of thought, and that the plan might not fully address the goals of either the users or the overall organization.

3. One Individual - The danger cited above also applies here. The individual must be able to work alone and have a good overview of both user and organization goals.

4. A Consultant - A consultant can provide special skills and objectivity not available in the organization. However, he will have to learn what is already known by employees and will consume their time getting the facts. He may be incorrect if he fails to identify all the factors involved. The rule of thumb is that the less you pay, the less you get.

A basic planning model was recently developed by Brent Bowman of the University of Houston, and Gordon Davis and James Wetherbe, both of the University of Minnesota. It contains three major stages:

1. Strategic IS Planning - This stage establishes the relationship between the Management Information System plan and the overall organizational plan.

2. Organization Information Requirement Analysis - This stage identifies the broad organizational requirements to establish a strategic information architecture that can then be used to direct specific application system development.

3. Resource Allocation - This is the allocation of resources from both the Information Systems and operational areas.

According to this model, planning moves from one stage to another in succession. The success of each stage depends on the previous stage. In all three stages different methodologies may apply, such as IBM's Business Systems Planning, or Jack Rockart's Critical Success Factors, or other more traditional approaches.

The trio recommends a stage assessment to see how much planning is needed, and how much is already accomplished.

Questions that help complete a <u>Strategic Stage</u> assessment are some of the following:

1. Is there a clear definition of organizational objectives and strategies?

2. Is there an Information Systems mission expressed in an IS charter?

3. Is there an assessment of the IS environment?

4. Are IS policies, objectives, and strategies established?

Some questions needed for an <u>Information Requirements Stage</u> Assessment are:

1. Is there an adequate assessment of organizational information requirements?

2. Is there a master IS development plan?

Completing the assessment by reviewing <u>Resource Allocation</u> includes the following kinds of questions:

1. Is there a resource requirement plan?

2. Is there an adequate procedure for resource allocation?

Strategic planning has been used successfully by such companies as Blue Cross and Blue Shield of Massachusetts, Avco Computer Systems Division, and the international construction and real estate firm of Perini Corporation.

Can strategic planning work for the State of Colorado? The Department of Social Services has already incorporated many of the features described here in planning for integration of their systems under their COIN project. (<u>C</u>lient <u>O</u>riented <u>I</u>nformation <u>N</u>etwork) Other agencies too, have made some efforts in this direction, but most have not. The Division of ADP encourages all agencies to seriously consider this approach to planning, not just for ADP but for the benefit of the organization and for the State.

B.   ADMINISTERING THE PLAN

What Does the Statute Say?

The Organization Act of 1968 created the Division of Automated Data Processing and defined its authority and functions. It declares that:

24-30-601

(d) Meeting the needs of State departments, institutions and agencies in efficient and economical ways within the resource capabilities of the State is the prime goal of automated data processing policy.

(e) To most effectively utilize resources committed to automated data processing and to assure the best service at reasonable cost to the public WHILE PRESERVING THE MANAGERIAL PREROGATIVES AND RESPONSIBILITIES ASSIGNED TO DEPARTMENT AND AGENCY HEADS BY STATUTE AND OTHERWISE, it is necessary to establish central planning, control, and coordination of automated data processing activities. (Emphasis added)

This statement of legislative intent has been translated into policies of service in support of agency goals within a framework of statewide objectives, while achieving economies through the sharing of resources.

The Division of ADP has consistently avoided using statutory authority to pass judgement on the wisdom or merit of any agency program. That is clearly within the prerogatives and responsibilities of the agency, and subject to the funding and support of the General Assembly. Rather, DADP has sought to assure that all viable alternatives to the solution of a problem are considered, the best one selected, and the costs and benefits carefully evaluated.

Funding has never been available to meet all the requirements contained in all the agency plans and budget requests. This is especially true in times of depressed revenues. The statute provides that DADP will:

24-30-603

(c) Review all existing and future automated data processing appli-
cations, planning, systems, programs, personnel, equipment, and
facilities and establish priorities for those that are necessary
and desirable to accomplish the purposes of this part 6;

Because of the complexities of today's data processing systems and
the fast changing industry the Division of ADP has taken the approach of
concentrating efforts where there is the biggest payoff, and the greatest
chance of success.

There is much concern about the increasing growth pressures in the
data processing area, especially during times of economic recession. To
some this may appear to be a runaway situation. The policy of the Division
of ADP has been one of planned growth, in an area characterized by rapid
growth. Control is shared with agencies in accordance with the statute.
This section on Administering the Plan is intended to clarify this policy,
relate it to the statute, and show how it works.

The Inter-Agency Interface

There are three levels at which the Division of ADP interacts with
State agencies:

1. Planning and Budgeting

2. Implementation and Acquisition

3. Evaluation Audit and Review

Until September, 1982 the professional staff of the Division of ADP
were both functional specialists, and agency coordinators. At that time
the Division was reorganized along the functional levels shown above.
This arrangement promises to give more consistent results, better
accountability, and better direction and control.

The Planning Section is responsible for the statewide agency coordi-
nation and approval process. Planning for office automation is assigned
to this section. Activities requiring inter-governmental agency coordi-
nation will be centered here.

The Implementation Section assists agencies in the acquisition of
equipment, software, services, and data communications facilities. State-
wide Requests for Proposals (RFP's) and master contracts are the responsi-
bility of this section. Training, the State data communication network,
and interface with the Division of Communications is assigned here.

The Evaluation Section is responsible for computer performance measurement, capacity planning, and the evaluation of application software. Mini and micro computing, data security, and complinace with State policies and standards are assigned to this section.

Each of these sections may establish standards and procedures and be assigned special projects related to their area of expertise.

Planned Growth in Action

Over the years the Division of ADP has evolved into an organization that not only sets policy, establishes standards and procedures, and exercises statutory authority over data processing in the State, but also plays an active part in planning and implementing better data processing systems and facilities. For example, the following special studies and task force projects have resulted in major improvements to data processing services, reductions in staffing requirements, increased capabilities, and savings/cost avoidance of millions of dollars:

"General and Financial Management Task Force Report"
Volume II, 1978 ADP Master Plan

"Higher Education Task Force Reports"
Volume III, 1978 ADP Master Plan

"Administration of Justice Task Force Study"
Volume IV, 1979 ADP Master Plan

"Revenue Data Processing Task Force Study"
Volume III, 1980 ADP Master Plan

"Capitol Complex Data Entry Task Force Study"
Volume III, 1981 ADP Master Plan

"General Government Computer Center 1982 Computer Capacity/
        Usage Study" September, 1982

This dual role as both a review authority and participating agency exercises the functions under the statute without infringing on the rightful authority of other State agencies or branches of government. Planned growth means more than mere limitation of growth and costs. It includes the provision of special expertise and experience to assist agencies in accomplishing the State's goals and objectives.

Tools and the Statute

The statute calls for the Division of ADP to plan and coordinate the areas of:

o Applications

o Systems

o Programs

o Personnel

o Equipment

o Facilities

o Establishing Priorities

o Reporting and budgetary requirements

The approved plans cover all of these areas. Coordination between agencies is an ongoing process that influences the plans and decreases the need to rework plans unnecessarily. Inter-agency coordination is therefore a most important tool for planning and managing growth.

Special studies and task force reports have also played a major role in planning in all of the above areas. These have varied from the general, such as the studies to determine the proper role and user clientele of State computer centers, to specific areas of data processing such as data entry. One special study conducted in 1976-77 resulted in selection and installation of the common financial reporting and accounting system for all State community colleges which is now known as HEFAS. HEFAS is also used at CU, CSU and will probably be installed at USC, UNC, and MSC.

Until recently applications have been reviewed and approved using many different tools:

o Feasibility studies by agencies and/or data processing staff. The State's Systems Standards Manual contains accepted forms and procedures for conducting cost/benefit studies.

o <u>Agencies' Plans</u> and supporting documentation such as Federal grant approvals, advance planning documents (APD's), memos, etc.

o <u>Equipment Transaction Requests (ETR's)</u> for equipment which are accompanied by written justification and explanation of the applications to be processed with the equipment.

o <u>Requests for Proposals (RFP's)</u> for software and/or equipment to meet specific application requirements. The Division of ADP must approve the purpose or application prior to issuance of the RFP. The Division of ADP may issue the RFP through the Division of Purchasing and conduct or assist in the evaluation of proposals and selection of the winning bidder.

o <u>Contracts</u> for data processing equipment, software, services, and for financing the purchase of equipment at lower rates than those available from the manufacturer. Every effort is made to see that terms favorable to the State, and any promises contained in a bid, are included and made binding in the contract.

This year the Division of ADP has initiated a new procedure for the approval of application software using the <u>Application Software Request</u> (ASR). See Appendix C. The procedure is built around a concept of the life cycle of an application from its inception through implementation, followed by periodic review and evaluation by the user agency and the Division of ADP. When evaluation shows an application no longer meets the needs for which it was designed, it is either replaced, redesigned, or simply discontinued. (See Exhibit II-G, "Conception, Birth, Death of Application")

CONCEPTION, BIRTH, DEATH, OF APPLICATION
(Agency Process)

EXHIBIT II-G
Page 1
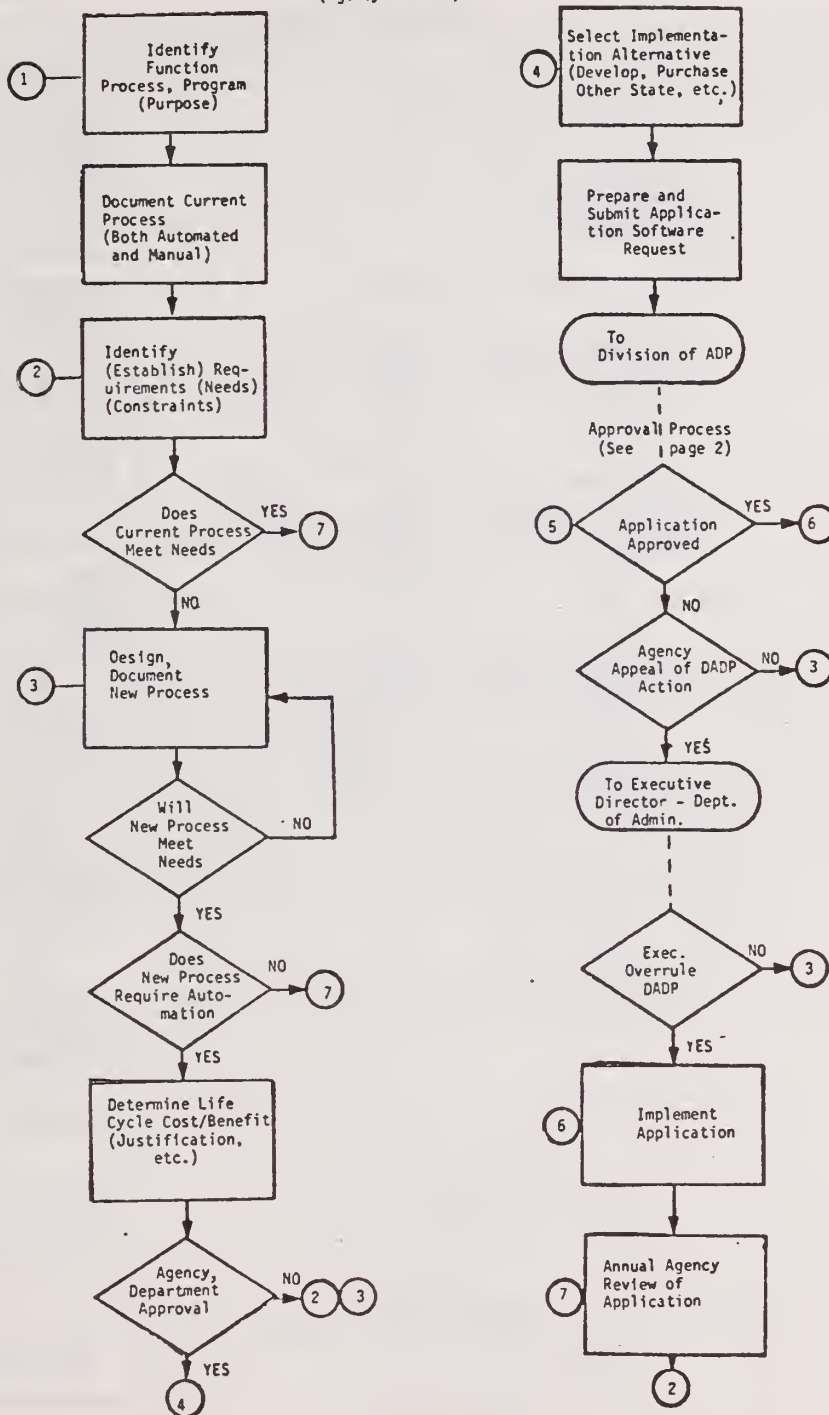
CONCEPTION, BIRTH, DEATH, OF APPLICATION
(Division of ADP Process)

- EXHIBIT II-G
Page 2
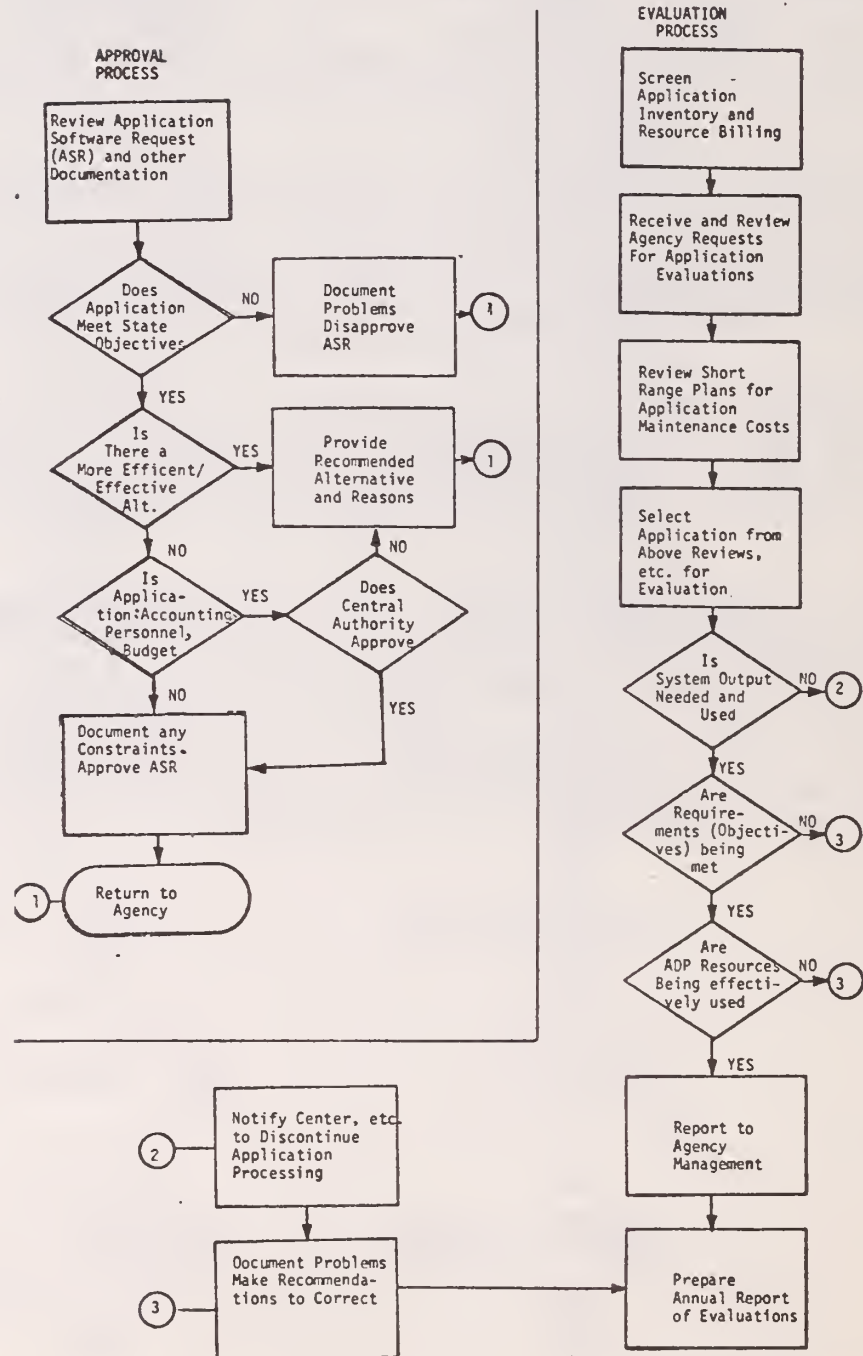
The budget review and recommendations contained in the annual ADP MASTER PLAN, BUDGET ANALYSIS, has served to identify the more critical data processing needs, and to set priorities according to statewide interests and criteria. This adds another layer of review to the already cumbersome budget approval process, which includes:

1. Departmental Review - Executive Director

2. Division of ADP - Recommendations to OSP&B

3. Budget Office/Trustees - State Authority

4. Governor's Budget Setting

5. Division of ADP - Recommendations to General Assembly

6. Legislative Review - Joint Budget Committee

7. Legislative Action - General Assembly Appropriations

Under the agreement of understanding with the General Assembly giving institutions of higher education broad managerial discretion over the allocation of funds, the expenditures for data processing have ceased to be line items in the appropriation, therefore budget analysis no longer has the same foundation as before. If the overall results of this approach are favorable and beneficial, it will raise serious questions about the budget review of data processing as a special category. This will not diminish the need to evaluate systems and set priorities, but may eliminate budget analysis as a tool.

Closely related to the ADP budget analysis process is the practice of budgeting for both the supply side (computer center) and the demand side (user agencies).

Analysis of budgets for both has imposed extra workloads to reconcile the requests for ADP services from user agencies with the funding for their support at the General Government Computer Center. The user agency simply may not coordinate the expected change in supporting services with GGCC, which may end up overfunded for one agency and underfunded for another, creating problems in balancing the budget. In addition, if the billing is a memo only, facilities such as disk storage may not be efficiently used and conserved since they are not subject to budget approval and control within the user agency. To the user such services are "free".

Annual salary act adjustments and other potted funds are normally added into the legislative appropriation and are not considered by the requesting agency. Funds have to be provided to user agencies to cover these costs, or a shortfall will result. Computation of these costs should be formalized and included as a part of the agency's budget request and appropriation. Future budgeting and billing systems should provide funds to users, but insure adequate funding of computer centers. Stated simply, the user agencies, regardless of their source of funds, should budget for resources required for their data processing needs. Computer centers should be free to respond to the needs of their users, and be both accountable and auditable for efficient management. Fees charged should be competitive yet sufficient to compensate for the costs of operation, depreciation and all fixed expenses. The tool needed to bring this about is a new budgeting and billing concept.

Control of Personnel is being administered two ways: 1) By approval of plans and applications that affect the levels of staffing, and 2) By coordination with the Department of Personnel on such matters as job classification, wage standards, recruitment, and training.

What is our Goal?

The goal of any plan is its implementation. The Division of ADP's goal in administering the plan is to see that the objectives of the various agencies' plans are met, on time, and within budget. Efforts spent on the day-to-day details of agency coordination, working with agencies and vendors to assure successful installation of equipment and systems, and working with agencies and purchasing agents to secure the best qualified vendor, are all directed toward successful implementation. The best plan in the world is no good unless it is implemented.

Before the ADP Master Plan can be implemented, however, it must be accepted and endorsed by the Governor. The General Assembly must then review it and appropriate funds to implement it. Acceptance is easier if the plan is specific and the results measureable, but the plan must still be "sold". Agencies have and will continue to be expected to seek support for their own agency plans and special projects. An improved method is desirable for the presentation and promotion of the statewide plan.

The Division of ADP has always responded to requests for information and clarification, and has relied on a proven record of successful projects and accurate information in seeking support for the ADP Master Plan. Today the problems are more complex, solutions less obvious, and decisions harder to make. To sell the plan effectively will require more effort to:

1. Make the plan clearer and easier to understand so it will sell itself.

2. Improve coordination and communication between agencies and/or branches of government, so that issues and impacts are better presented and understood.

If a more active presentation is made of future plans using these principles, it seems likely that the chances for acceptance and implementation of the plan will be enhanced. As we said before, our goal is implementation.

C. 1982 PLANNING OBJECTIVES

The planning objectives identified in the 1982 ADP Master Plan are listed below, and a brief statement on their status.

Applications and Capacity Planning

o Assure (performance) measurement capabilities are established and utilized by all data processing organizations.

Status: Continued. Request for a new hardware monitor is contained in 1983-84 budget request. Software analysis was performed at GGCC. These activities will be continued, funding permitting.

o Encourage consideration of any State data (processing) installation's cost benefit potential when seeking to satisfy processing need.

Status: No specific action taken. Objective is implicit in cost-benefit analysis of applications requested, and therefore is not continued.

o Institute substantial billing discounts for non-prime shift workload processing.

Status: Continued. Individual data centers will have to implement this objective when software and funding permit.

o Employ the advantages of distributed data processing.

Status: Continued. Most systems development now includes some distributed processing.

o Establish a method to better plan, justify, develop, monitor and purge application software.

Status: Continued. A start was made with the introduction of a policy and procedure for application software management. (See Appendix C, Application Software Request) The 1983-84 fiscal year plan calls for design of a system to inventory and monitor application software. The system will be operated by the Division of ADP.

o Continue main planning thrust of off-loading data entry functions
   to user agencies wherever possible.

   Status: Continued. Data entry is an important element in most dis-
            tributed data processing plans. For high volume batch data
            entry the Pueblo Data Entry Center (PDEC) has been established
            to serve all State agencies. (See Appendix B)

o State agencies heavily involved in data entry functions will set up,
   monitor and enforce keystroke production standards appropriate for
   individual applications and environment.

   Status: Continued. Most production data entry organizations keep
            records of production volumes, including keystroke counts.
            They are encouraged to take the next step and develop
            standards appropriate to each application in their respective
            environment.

o Continue to evaluate and select outside (private industry) data entry
   support as a cost effective alternative for overload requirements.

   Status: Continued. If the Pueblo Data Entry Center is properly
            managed and funded the need for this alternative will diminish.
            In those cases where it will still be needed, overload key-
            punch services will continue to be used. (See Appendix B)

   Word Processing and Automated Office

o Assure that proper cost/benefit analysis has been made before any
   acquisition of word processing equipment.

   Status: Continued. The statewide award made in December, 1981 has
            been very helpful. The winning vendor in three of the
            four categories, Wang, has offered professional support to
            conduct detailed cost/benefit studies in those agencies
            requesting it. Many agencies have done so, and studies are
            projected months in advance. Favorable results are necessary
            before acquisition is approved.

o Encourage agencies to take advantage of the State award rather than spending already scarce personnel resources re-evaluating proposals because of minor requirement differences.

   Status: Continued, Most agencies are taking advantage of the State award. Several agencies of other states and local government have contacted the Division of ADP for information, and some of them will probably benefit from it also.

o Encourage agencies to evaluate total office needs based upon current and future processes or functions.

   Status: Continued. This process will be slow as few agencies are ready or able to assess their total needs at this time.

Data Communications

o Satisfy data communication requirements through the use of shared facilities wherever feasible.

   Status: Continued. This will continue as a prime objective. The savings possible are substantial.

o Implement an alternative to TELPAK by March, 1983.

   Status: Continued. No single alternative exists. The Division of Communications will provide some agencies with microwave service before April 1, 1983. The effort will intensify during the next nine months.

o Encourage all agencies to assist in the implementation of the Colorado Communications Network.

   Status: Continued. It will take many years to accomplish this objective.

o Concentrate financial resources toward the facilities needed to implement the Colorado Communications Network.

   Status: Continued.

o Examine and inventory data communication equipment and network
   arrangements to understand commonality.

   Status: Continued. This was a key factor in TELPAK, and will continue.

o Determine common routing arrangements that will best serve the majority
   of State agencies.

   Status: Continued.

ADP/Computing Performance Evaluations

o For the 82-83 fiscal year $30,000 has been requested for the purchase
   of a modern state-of-the-art computer hardware monitor, to be used
   for computer performance measurement and evaluation on a statewide
   basis.

   The Division of ADP plans to continue to perform ADP performance
   evaluations, special studies, computer hardware monitor analysis,
   follow-up studies, and systems/applications reviews to fulfill the
   statutory requirements as previously mentioned.

   Status: The hardware monitor was not funded and the request continues
            in 1983-84. These two objectives have been combined into
            one ongoing objective and rewritten to read as follows:

            -- The Division of ADP as part of an ongoing program of
               performance evaluation and capacity planning, will employ
               modern hardware and software techniques to measure
               resource utilization and project future resource needs.

o Application reviews will be stressed in fiscal 1982-83.

   Status: This objective has been continued and rewritten as follows:

            -- Application reviews will be made to identify ineffective
               or inefficient software which can be recommended for
               improvement or elimination.

Staff Proficiency Development

o Each agency should acquire sufficient data processing staff develop-
   ment funding.

   Status: Deleted. This is implicit in the following objectives.

o Each agency should identify and pursue areas of need in data pro-
   cessing training.

   Status: Continued. The Department of Personnel will now attempt to
            provide training for employees, under provisions of new
            legislation. (SB308, CRS Rev. 1973, 24-50-122) The agencies
            may still have to provide funds for unusual or special needs.

o Encourage additional agencies to utilize to a greater extent the
   video training libraries and equipment.

   Continue to enhance the base curriculum of the video training
   library.

   Status: Under the new legislation the video training libraries and
            equipment may pass to the Department of Personnel, or even
            be dropped. These objectives continue. They are combined
            and rewritten as follows -

            -- Enhance the State's video training facilities and work
               with the Department of Personnel to encourage their use.

o Provide annual ADP management training seminars for sharing of
   information among State ADP Managers.

   Status: Continued. This is one of the most successful tools for
            statewide coordination and dissemination of information. It
            will continue as long as funding permits.

D.   STATUS OF RECOMMENDATIONS PRIOR TO 1982

Introduction

From time to time it is necessary to pause in the planning process and take stock of where we are. The ADP Master Plan and task force reports have been created in order to meet the statutory responsibility to (1) formulate recommendations for a current and long range automated data processing plan; and (2) to report to the Governor and the General Assembly annually concerning the existing and requested uses, applications, and programs of automated data processing, including recommendations and priorities for implementation.

Initially, efforts were concentrated on establishing policies by which the Division of Automated Data Processing would carry out its functions. Heavy emphasis was placed on central planning, coordination, and control of data processing, but especially on the equipment to be used. Centrally operated data centers and central systems development was encouraged. Because the State Central Computer Center was operated by the Division of ADP, it received heavy emphasis.

In 1973 the General Assembly recognized the need to expand the planning and coordination function in order to deal with the tremendous growth of data processing. In July of that year the Planning and Coordination Section was created and staffed at the level that it remains today. Lets look at the recommendations contained in Master Plans beginning in 1973, and see what has been accomplished since then.

The ADP Master Plans from 1973 to 1982 contained approximately 118 separate recommendations and/or planning objectives. Many of these were either revisions, were overlapping, or in some cases continuing recommendations. In a few cases, such as the Financial Management and Revenue Computer Center studies, many detail recommendations were subordinate to major recommendations. Of the 118 major recommendations there were 96 accepted and at least partially implemented. The other 22 were either abandoned completely or required funds or other action before they could be implemented. Thus 81% of the recommendations were accepted.

1983 STATE OF COLORADO **ADP MASTER PLAN**

For this review the recommendations can be combined into the following categories:

1. Planning and Budgeting

   a. Agency and State Master Plans
   b. Disaster/Recovery Plans
   c. Procedures and Standards
   d. Funding

2. Computer Facilities

   a. Computer Centers
   b. Equipment
   c. Software and Supporting Systems
   d. Distributed Data Processing
   e. Office Automation

3. Data Communication

4. Information Management

   a. Data Base Management Systems
   b. Applications and Shared Systems

5. Performance Evaluations

   a. Computer Utilization and Capacity Planning
   b. Application Effectiveness and Efficiency

6. Personnel

   a. Training

7. Higher Education

1. <u>Planning and Budgeting</u>

   <u>ALL DEPARTMENTS, INSTITUTIONS, AND AGENCIES SHOULD FURNISH
   LONG-RANGE ADP PLANS TO THE DIVISION OF ADP BY APRIL 1 OF EACH
   YEAR</u>.

This has been a continuing requirement for every year since 1978. The format for agency plans has been included in every publication of the State ADP Master Plan. The due date of the plan has been a stumbling block. Most agencies begin work on their budget preparations soon after publication of the current year's appropriations. As a result, many agencies have not yet responded to the requirement for agency plans until much later.

Below is the list of agencies submitting plans this year, and the date submitted.

AGENCY	DATE SUBMITTED
Department of Administration (except GGCC)	5/26/82
General Government Computer Center	8/11/82
Department of Agriculture	6/10/82
Department of Corrections	5/82
Department of Health	5/10/82
Department of Highways (Draft)	9/9/82
Department of Institutions	9/29/82
Judicial Branch	5/17/82
Department of Labor and Employment:	
Employment and Training	9/15/82
Labor	2/82
Compensation Insurance Fund	8/82
Department of Law	3/26/82
Department of Local Affairs	10/82
AJCC/CBI	5/82
Department of Natural Resources	9/82
Department of Personnel	8/10/82
Department of Regulatory Agencies	5/82
Department of Revenue	6/28/82
Department of Social Services	7/30/82
Department of State	5/10/82
Department of Higher Education	
Arapahoe Community College	8/12/82
Community College of Denver	5/7/82
Mesa College	6/82
Metropolitan State College	5/82
Otero Junior College	1/6/82
Trinidad State Junior College	2/11/82

The following agencies are operating under plans which have not been changed from the previous year.

Department of Education
Colorado School of Mines
Colorado State University
Lamar Community College
Pikes Peak Community College
Pueblo Vocational Community College
University of Colorado
University of Northern Colorado
University of Southern Colorado

The intent of having agency plans in advance of the budget cycle is obviously not being achieved.

The agency plans are used to establish statewide priorities. Budget initiatives and ADP decisions are contained in the departmental budget figures submitted to the Office of State Planning and Budgeting and the Governor for review and mark setting. The Division of ADP reviews and rates agency priorities and submits a rated priority list as part of this process of establishing the Governor's budget request. Final budget documents are later prepared in detail, and submitted to the Legislature. The detail for the ADP funding portion is submitted to the Division of ADP in October, using form 454, from which the Budget Analysis volume of the ADP Master Plan is prepared.

It is this close relationship between the short-range plan and the budget that interferes with the planning process itself. Agencies add and delete items in the budget at the last minute, and change their plans. However, unless a major shift in direction takes place only the short-range tactical plan is affected, and not the overall goals of the agency. The emphasis on long-range planning is an important one, and long-range planning will continue to be required.

The following, issued in 1980, requires that agencies create, review, and submit an updated disaster recovery plan by March 1, of each year.

THE POLICY, THEREFORE, IS THAT EACH STATE AGENCY MANAGING AND/ OR USING DATA PROCESSING RESOURCES SHALL DEVELOP AND IMPLEMENT SECURITY PROCEDURES, DOCUMENT SECURITY PLANS, AND EVALUATE SECURITY READINESS.

Past visits to computing facilities during performance evaluations has shown a wide variance in the security measures of each site. Most emphasis has been on the physical aspects of security: control of access, smoke and fire detection/extinguishing systems, water detection, and emergency procedures. The area neglected in nearly all cases was disaster recovery planning. It is reasonable and desirable to prevent or minimize the effects of a disaster, should one occur. However, it is dangerous to be smug about these precautions. Consideration must be given to what to do if precautions fail, and severe damage or complete destruction takes place.

In order to further encourage development of adequate security plans the 1982 ADP Master Plan contained a sample Disaster Recovery Plan (Appendix G) for State agencies to follow. Unfortunately, only two agencies have submitted such plans to the Division of ADP. The reason is fairly obvious: There is a high cost in human resources to prepare such a plan and a high cost in dollars to implement it. Since no one knows if it will ever be used, it carries a low priority.

The consequences of a severe disaster without an adequate disaster recovery plan are to be viewed with alarm. Colorado agencies are now so dependent on data processing that almost all would be affected in some way. Many would find it impossible to function without the computer. A way must be found to deal with this problem before a severe disaster takes place.

STANDARD SERVICE LEVELS SHOULD BE DEVELOPED FOR EACH SERVICE CENTER AND SUBMITTED TO THE DIVISION OF ADP FOR APPROVAL. THESE SERVICE LEVELS SHOULD BE USED IN DEVELOPING COST/BENEFIT ANALYSIS FOR NEW SYSTEMS.

Basic service level standards were included in the 1977 through 1980 Master Plans. Each computer center should develop their own service level standards using these original standards as a guideline. A computer center may have unique requirements that the original standards did not satisfy. The proposed service levels should be submitted to the Division of ADP for approval.

In past performance audits and needs surveys the complaint voiced by many dissatisfied users was the slow response times on terminals, or the slow turnaround times for batch jobs. This is not new. It happens whenever the workload grows too big for the system to handle efficiently. Poor service can negate the anticipated benefits of an application. Performance evaluation using hardware and software monitoring, and application auditing, are ways by which the Division of ADP plans to monitor service levels. Standards of service will continue to be required from each service center.

INSTITUTE SUBSTANTIAL BILLING DISCOUNTS FOR NON-PRIME SHIFT WORKLOAD PROCESSING.

A standard method of charging for services by computer centers was published in the 1979 ADP Master Plan. It provided for variable rates to be used in the billing algorithms used by computer centers. Studies show that the computer is busiest between 8:00 AM and 5:00 PM. More effort is needed in developing charging algorithms as a way to distribute workloads and get the most effective utilization out of the State's computing equipment. More even distribution of work can forestall expensive upgrades. Improved billing systems and service center practices in rate setting will be an ongoing objective statewide.

2. Computer Facilities

THE STATE SHOULD MOVE IN THE DIRECTION OF SHARING COMPUTER FACILITIES TO MAXIMIZE ECONOMIC AND SERVICE BENEFITS.

This recommendation has been the keystone of State planning over the years. It is the area where the most progress has been made. Conceived in the era of large and costly mainframes and batch processing it provided millions of dollars in savings by avoiding costly duplication. It also was aimed at providing small users with sophisticated systems they could not otherwise afford. In 1973 there were 24 identified computer centers. (Exhibit II A) By 1980 the number had been reduced to 17. (Exhibit II B) Distributed Data Processing, a communication network, and more powerful minicomputers made it possible to increase computing power to the users.

The number of major centers has now stabilized. Most obsolete equipment has been replaced. The pressures for growth are not so much in the mainframes as in the distributed processing nodes, and the minicomputers. The ability to provide adequate communications facilities for a State network is also an important factor.

EXHIBIT II-A

1973 COMPUTER CENTERS

Administrative Installations

Agency/Location	Computer
1. Dept. of Administration	IBM 360/50
2. - CBI/CCIC & Criminal Justice	UNIVAC 418-III
	UNIVAC 9300
3. Department of Revenue	IBM 370/135
	IBM 370/145
4. Department of Social Services	IBM 370/145
5. Department of Labor and Employment	Burroughs 3500
6. Judicial Branch	IBM 370/135
7. Colorado State Hospital/Pueblo	UNIVAC 9400
8. Department of Natural Resources	NCR 200

Higher Education Installations

Agency/Location	Computer
1. Adams State College	IBM 360-30
2. Colorado School of Mines	PDP-10
3. Colorado State University	CDC 6400
4. Denver Regional Computer Center/MSC	IBM 370/145
5. El Paso (Pikes Peak) Community College	IBM 360/30
6. Fort Lewis College	IBM 360/22
7. Lamar Community College	PDP-8
8. Mesa Junior College	IBM 360/22
9. Otero Junior College	IBM 1620
10. Southern Colorado State College (USC)	IBM 360/40
11. Trinidad State Junior College	IBM 1401
12. University of Colorado, Academic	CDC 6400 (2)
	IBM 1401
13. - Administration	IBM 370/145
14. - Medical Center	IBM 360/40
	IBM 1802
15. University of Northern Colorado	IBM 360/40
16. Western State College	IBM 360/22

REPRESENTATION OF EXISTING COMPUTER CENTERS
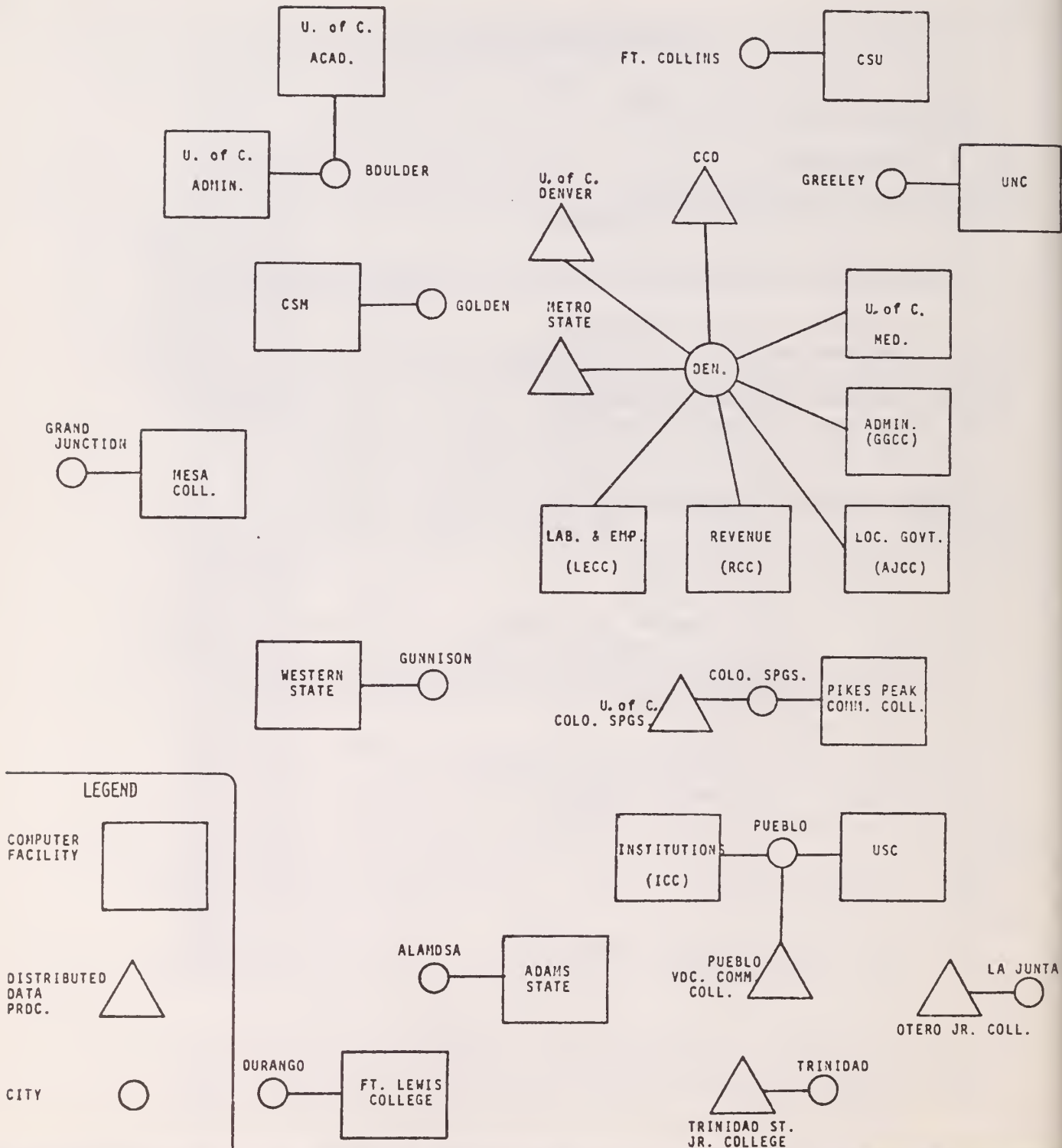
CONTINUALLY RESEARCH THE AVAILABILITY OF NEW HIGH LEVEL SOFT-
WARE LANGUAGES.

The user is getting more involved with the development of appli-
cations as distributed data entry and data processing moves the
computer out into the user area. At the same time professional pro-
grammers and analysts are more in demand, and therefore less avail-
able to develop and maintain applications. The result has often
been a backlog of requests of as much as two years or more.

While the State has sought ways to increase programmer pro-
ductivity, vendors are developing more "user friendly" languages to
enable users to become "programmers" with little or no special
training. Generally the more sophisticated high level languages will
consume more hardware resources. Compared to the human resources
saved, and the faster development time, this is probably a good
trade-off, since hardware costs are continuing to decrease while
personnel costs are on the rise. The State intends to pursue this
objective.

AGENCIES ARE ENCOURAGED TO EXAMINE THE FEASIBILITY OF EMPLOYING
ECONOMIC DISTRIBUTED SYSTEMS.

Distributed Data Processing (DDP) strives to place processing and
storage where it will satisfy organizational goals. DDP distributes
processing from a single computer to multiple computers, each with
well defined responsibilities and limited operational overhead. They
are linked together in a network, each with its own devices and work-
stations, and connected to a host mainframe.

The wide choice of DDP alternatives must be evaluated on the
basis of their cost-benefit advantages within a particular organiza-
tion/application. Judicious application of DDP concepts is capable
of providing improved user services while serving to control growth
of large computer centers.

AGENCIES ARE ENCOURAGED TO EXAMINE THE COST-BENEFITS OF EMPLOYING
WORD PROCESSING AND OFFICE AUTOMATION TO MEET THEIR TOTAL OFFICE NEEDS.

With office labor costs steadily rising, and computer costs
decreasing, office productivity is now the watchword. Office staff
costs have risen from 20-30% of the total, to 40-50%. (Donovan J.
and McInick S., Harvard Business Review, 1977)

The Division of ADP, following an indepth study, issued a Request for Proposals (RFP) in the fall of 1981 for four levels of word processing and/or office automation equipment:

(1) Non-Integrated Single Workstation

(2) Small Cluster (2 to 4 workstations, 2 printers)

(3) Large Cluster (5 to 10 workstations, 5 printers)

(4) Integrated System (Networking of any of the above)

All four levels have communication capability to large computers. The awards for these four levels should meet the needs of the vast majority of State agencies without their having to conduct a separate bid evaluation. The awards were made for three years, to permit ample time to plan, develop, and evaluate the installations. Agencies are asked to take advantage of the State awards after they have studied their office needs and made a proper cost-benefit analysis. (The vendors given the award can assist in this.)

3.   Data Communications

STUDY THE DATA COMMUNICATIONS REQUIREMENTS OF STATE AGENCIES AND INSTITUTIONS OF HIGHER EDUCATION AND DEVELOP A STATEWIDE DATA COMMUNI- CATIONS PLAN.

Since the publication of this recommendation in the 1979 Master Plan, it has become a permanent part of the planning process. Data communications is only a part of the total State communications task of the Division of Communications. In spite of personnel shortages, significant progress has been made, and significant savings realized.

In the planning effort from 1980 to 1982 the State created and expanded TELPAK circuits which provide bulk service to agencies at much lower rates than regular exchange rates for individual cir- cuits. TELPAK facilities have saved the State over $638,000 to date. (See Exhibits II-C and II-D) TELPAK mileage cost currently averages $2.79 per mile, versus a regular rate of $4.09. Over $11,300 was saved the first month of operation, and has risen to over $32,000 per month.

EXHIBIT II-C

STATE OF COLORADO
TELPAK FACILITIES

1980
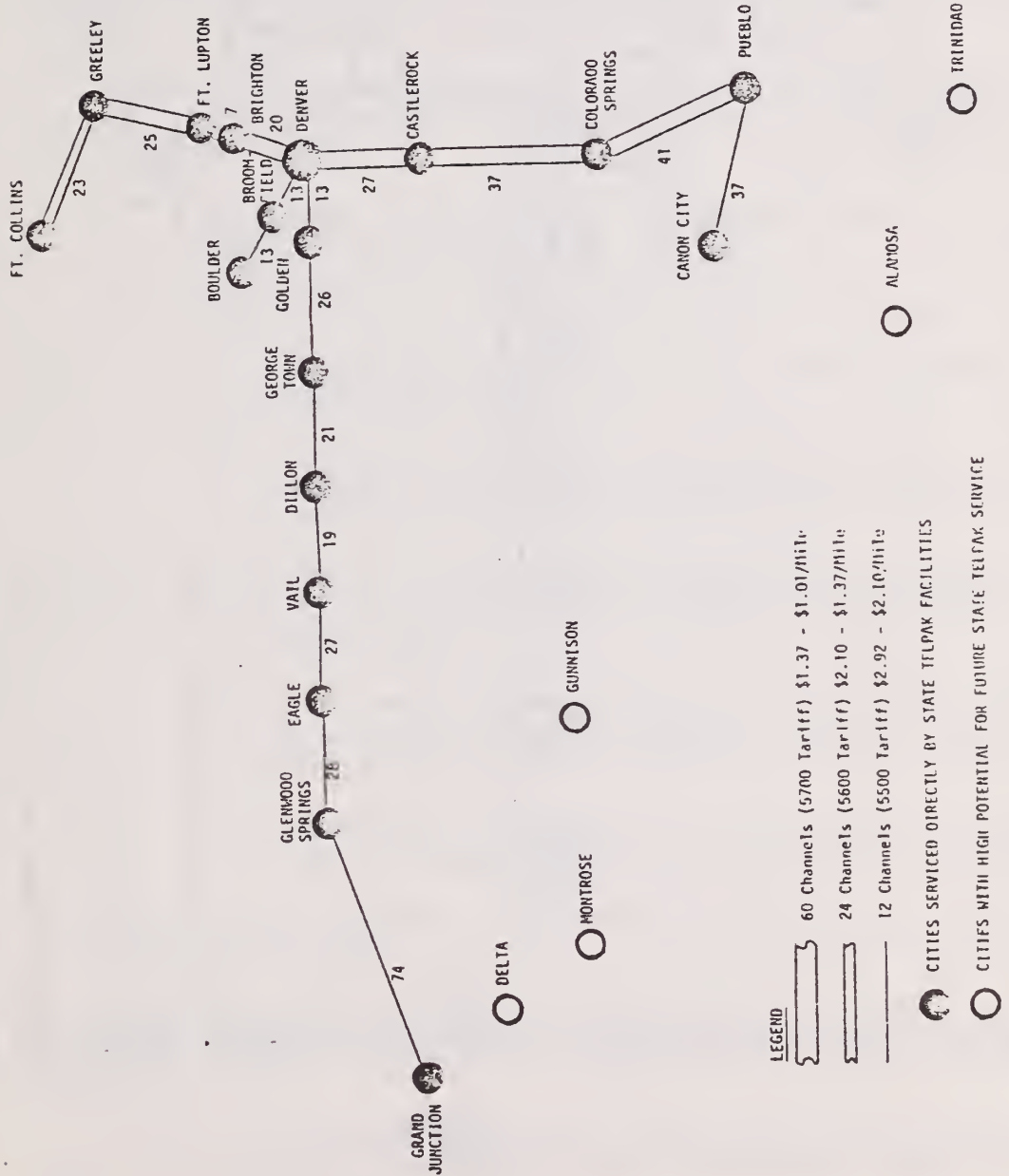
LEGEND

60 Channels (5700 Tariff) $1.37 - $1.01/Mile

24 Channels (5600 Tariff) $2.10 - $1.37/Mile

12 Channels (5500 Tariff) $2.92 - $2.10/Mile

CITIES SERVICED DIRECTLY BY STATE TELPAK FACILITIES

CITIES WITH HIGH POTENTIAL FOR FUTURE STATE TELPAK SERVICE

STATE OF COLORADO
TELPAK FACILITIES

EXHIBIT II-D
OCTOBER '81

GREELEY

FT. LUPTON

BRIGHTON

DENVER

CASTLE ROCK

COLORADO SPRINGS

PUEBLO

23

25

7

20

30

33

41

37

FT. COLLINS

BROOMFIELD

12

13

CANON CITY

BOULDER

GOLDEN

13

LOOKOUT MT.

5

GEORGE TOWN

23

DILLON

21

VAIL

19

EAGLE

27

GLENWOOD SPRINGS

28

74

GRAND JUNCTION

LEGEND:

60 Channels (5700 Tariff) $1.37 - $1.01/Mile

24 Channels (5600 Tariff) $2.10 - $1.37/Mile

12 Channels (5500 Tariff) $2.92 - $2.10/Mile

CITIES SERVICED DIRECTLY BY STATE TELPAK FACILITIES

1983   STATE OF COLORADO   ADP MASTER PLAN
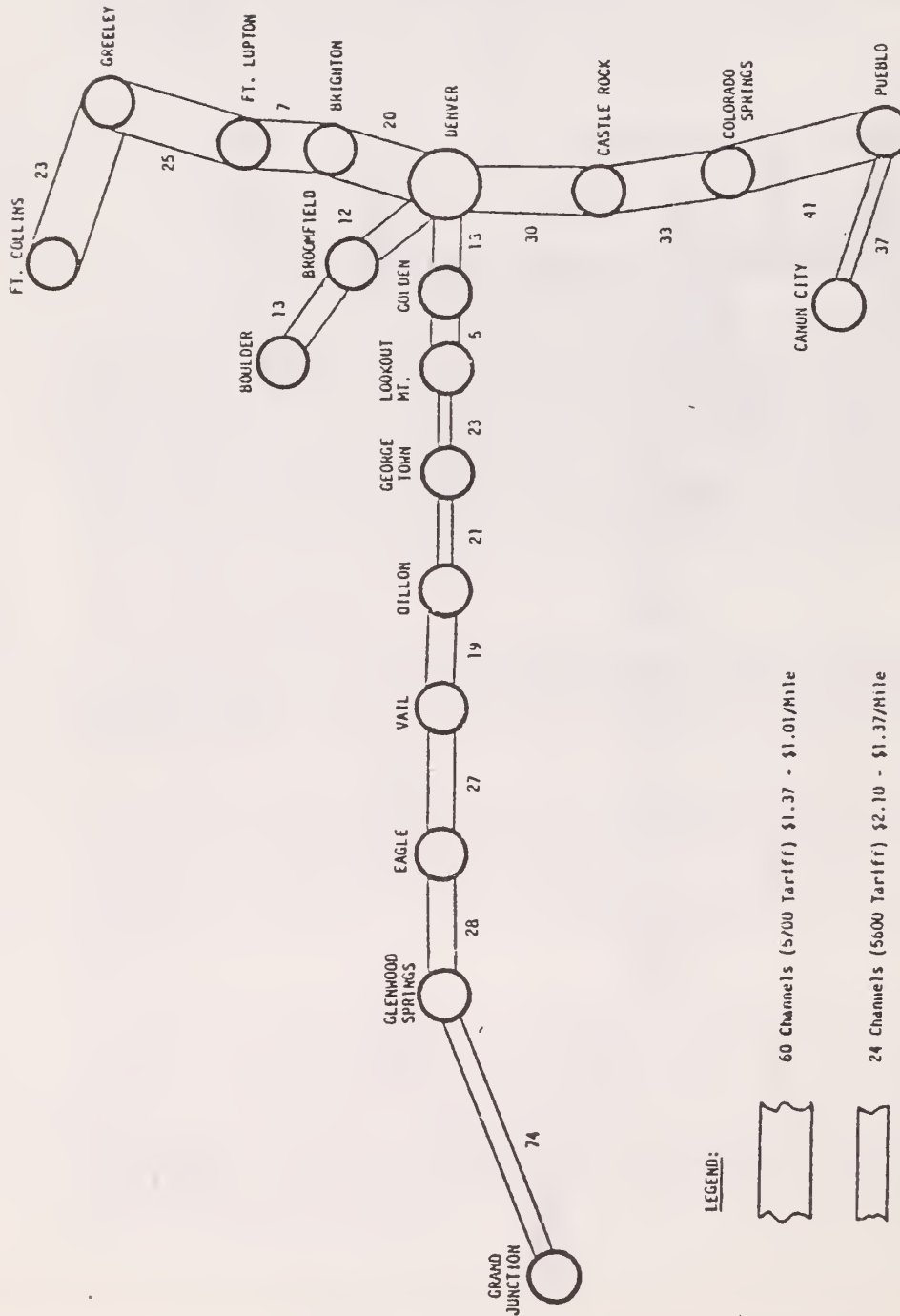
An inventory of TELPAK circuits was created from which billings are prepared by the Division of Communications to charge users for their portion of the total costs. (See Exhibit II-E) As more users are added, the rates are lowered so that the proportional costs are spread fairly over all users. The commercial rate of $4.09 can be compared to the TELPAK rates in Exhibit II-E to give the reader an idea of the savings.

Almost all planning objectives since 1980 have been accomplished, or are a continuing process. Analysis of these objectives shows two very important things:

(1) The process is a continuing one that will never be completed, only up-to-date.

(2) The objectives can all be combined into just five:

 (a) Continue to study the availability of alternative communication facilities.

 (b) Continue to monitor and take advantage of new technologies in facilities, equipment, and software, in the State data communications network.

 (c) Study and inventory data communications equipment and routing arrangements in order to determine commonalities.

 (d) Encourage the bulk acquisition and sharing of data circuits and routing arrangements that will best serve State agencies.

 (e) Encourage all agencies to assist in the implementation of the Colorado Communications Network.

The specific objective not included is to create an alternative to TELPAK by March, 1983.

STUDY LONG RANGE ALTERNATIVES TO BELL SYSTEM FACILITIES AND MAKE RECOMMENDATIONS FOR BUDGETING AND IMPLEMENTATION OF THOSE THAT ARE JUSTIFIED.

There is no single alternative to TELPAK that is possible at this time. The Bell System monopoly has no comparable competition capable of serving State agencies.

EXHIBIT II-E

PAGE 1

10/24/82

DEPARTMENT OF ADMINISTRATION
DIVISION OF COMMUNICATIONS
TELPAK BILLING

AGENCY 220400 COLO GENERAL GOVERNMENT COMPUTER CENTER   AUG 22 TO SEPT 21, 1982

CIRCUIT NO.	K BILLING NO.	DESCRIPTION	FROM/TO	CHAN NO.	TELPAK MILES	TELPAK RATE	TELPAK COST
20FD124517	751-3915	GGCC/BOULDER	DENVER - BROOMFIELD	8	12	1.52	18.24
			BROOMFIELD - BOULDER	8	13	1.70	22.10
CIRCUIT TOTAL 20FD124317	751-3915	GGCC/BOULDER			25		40.34
20FD125621	751-4154	GGCC/PUEBLO	DENVER - CASTLE ROCK	25	30	1.01	30.30
			CASTLE RK - COLO SPGS	25	33	1.02	33.66
			COLO SPGS - PUEBLO	21	41	1.01	41.41
CIRCUIT TOTAL 20FD125621	751-4154	GGCC/PUEBLO			104		105.37
20FD126476	751-4482	GGCC/GRE/FTC/GJC	DENVER - BRIGHTON	27	20	1.01	20.20
			BRIGHTON - FT LUPTON	27	7	1.01	7.07
			FT LUPTON - GREELEY	27	25	1.01	25.25
			GREELEY - FT COLLINS	17	23	1.22	28.06
			DENVER - GOLDEN	6	13	1.82	23.66
			GOLDEN - LMONT MTN	6	5	2.10	10.50
			LMONT MTN - GEO TOWN	6	23	2.10	48.30
			GEO TOWN - DILLON	6	21	2.10	44.10
			DILLON - VAIL	6	19	1.95	37.05
			VAIL - EAGLE	6	27	1.62	49.14
			EAGLE - GLENWD SPGS	6	20	1.62	50.26
			GLENWD SPGS - GRND JCT	4	74	2.56	189.44
CIRCUIT TOTAL 20FD126476	751-4482	GGCC/GRE/FTC/GJC			265		533.73
20FD30091	534-3509	GGCC/COLO SPGS	DENVER - CASTLE ROCK	10	30	1.01	30.30
			CASTLE RK - COLO SPGS	10	33	1.02	33.66
CIRCUIT TOTAL 20FD30091	534-3509	GGCC/COLO SPGS			63		63.96
20FD31652	534-5139	GGCC/JUD/COLO SPGS	DENVER - CASTLE ROCK	37	30	1.01	30.30
			CASTLE RK - COLO SPGS	12	33	1.02	33.66
CIRCUIT TOTAL 20FD31652	534-5139	GGCC/JUD/COLO SPGS			63		63.96
20FD32004	534-3679	GGCC/JUDICIAL/BLDR	DENVER - BROOMFIELD	14	12	1.52	18.24
			BROOMFIELD - BOULDER	14	13	1.70	22.10
CIRCUIT TOTAL 20FD32004	534-3679	GGCC/JUDICIAL/BLDR			25		40.34
20FD32225	534-3755	GGCC/JUDICIAL/GRY/FTC	DENVER - BRIGHTON	55	20	1.01	20.20
			BRIGHTON - FT LUPTON	41	7	1.01	7.07
			FT LUPTON - GREELEY	41	25	1.01	25.25
			GREELEY - FT COLLINS	27	23	1.22	28.06
CIRCUIT TOTAL 20FD32225	534-3755	GGCC/JUDICIAL/GRY/FTC			75		80.58
20FD38222	534-0112	GGCC/COLO SPGS	DENVER - BRIGHTON	9	20	1.01	20.20

The Division of ADP and the Division of Communications are working together to develop various alternatives and combinations of facilities to present to various agencies for thier approval. Some of these choices will be available only to certain users. They include expansion of the State's microwave circuits to handle data, Digital Data Services, purchased Bell facilities, and similar alternatives. Only some of these will be available by April 1, 1983 when TELPAK ceases to exist. TELPAK will be used as long as it exists to obtain maximum benefit to the State. For those agenices that still use those circuits after April 1, 1983 drastic increases in rates of 200% and up are expected.

Careful examination of sample circuits failed to show a consistent pattern of rate increases as a percentage. In an effort to assist State agencies in their budgeting for these rate increases the Division of ADP prepared a cost analysis of five typical circuits and provided it to users. (See Exhibit II-F) Examples 4 and 5 were interexchange circuits compared to TELPAK, and projected rate increases of 212% and 283% respectively. Projected increases for the three intraexchange circuits were 610% (Highway Department to GGCC), 113% (Capitol Complex multipoint to GGCC), and 67% (Capitol Complex point-to-point to GGCC).

These tremendous increases make the State's microwave system very cost effective. The new microwave facilities now being installed will permit the Division of Communications to begin providing data communications services to the State's network.

The Divisions of ADP and Communications are holding planning sessions with State agencies to begin implementing their transfer from TELPAK circuits to the microwave system.

EXHIBIT II-F

Page 1 of 2

Circuit Examples:

1. Intraexchange, 4 wire-point to point circuit (one mile or less) within the same wiring center. The example below is from GGCC to the Highways complex.

Current Cost	Proposed Tariff	Increase Amount	Cost %
$ 11.92	$ 84.62	$ 72.72	610%

2. Intraexchange, 4 wire-multi point circuit. The example below is from GGCC to the Capitol Hill complex.
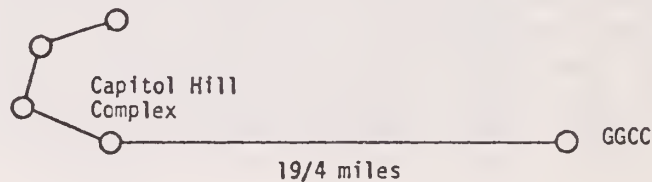
Current Cost	Proposed Tariff	Increase Amount	Cost %
$114.02	$242.52	$128.50	113%

3. Intraexchange, 4 wire-point to point circuit. The example below is from GGCC to the Capitol Hill complex.
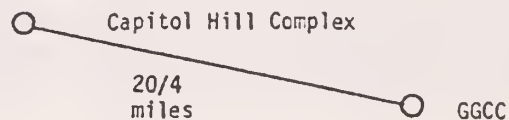
Current Cost	Proposed Tariff	Increase Amount	Cost %
$ 59.60	$ 99.56	$ 39.96	67%

EXHIBIT II-F
Page 2 of 2

4. Interexchange, 4 wire-point to point circuit. The example below
    is from Denver Computer Center to Colorado Springs.

Q Denver

IXC/63 miles
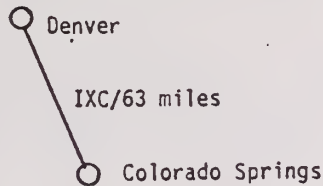
O Colorado Springs

Current Cost	Current IXC Cost	Proposed IXC Cost	Increase Amount	Cost %
$112.01	$298.49	$349.80	$237.79	212%

5. Interexchange, 4 wire-multi point circuit. The example below
    is from Denver Computer Center to Colorado Springs (2 terminal
    locations) and Pueblo (3 terminal locations).

Q Denver

IXC/63 miles
 IXC/63 miles

Colorado Springs

IXC/41 miles

Pueblo
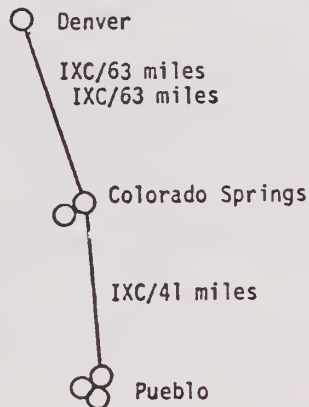
Current Cost Telpak	Current IXC Tariff	Proposed Tariff	Increase Amount	Cost %
$199.18	$527.39	$683.48	$484.30	283%

4.   Information Management

Some things never change. In 1973 a major objective was:

TO PROVIDE ACCURATE, TIMELY, AND MEANINGFUL INFORMATION TO
MANAGEMENT PERSONNEL IN SUPPORT OF DECISION-MAKING RESPONSIBILITIES.

Some of the problems identified in the 1973 plan are still with
us even if not as severe:

o   There is lack of integrated information systems among
     agencies which can be assessed quickly and easily for
     management decision making, and planning purposes.

o   There is no established system for obtaining information
     required from several or all State agencies for Statewide
     management, decision making, and planning.

o   There is duplication in the development and maintenance of
     ADP systems among agencies, with the consequent expansion
     of development and maintenance costs.

o   There is a lack of software packages for data base manage-
     ment, data retrieval, publications production, and statis-
     tical analysis. (Emphasis added)

Some progress has been made to alleviate these problems,
however:

o   ADABAS Data Base Management System was installed at GGCC.

o   POISE (People Oriented Information System for Education)
     was acquired for use in Higher Education on Digital Equip-
     ment PDP 11's.

o   SPSS (Statistical Package for Social Sciences) was installed
     at GGCC, AJCC, and other facilities in Higher Education.

These packages are useful tools, but they do not address the basic question of how State agencies are to manage information. Unless the basic elements, structures, and definitions are applied uniformly, data still cannot be relied upon for use beyond its original purpose or application.

<u>EACH DEPARTMENT AND AGENCY OF THE EXECUTIVE BRANCH SHOULD ENCOURAGE AND PARTICIPATE IN DETERMINING WHAT APPLICATION SYSTEMS CAN BE SHARED, AND PURSUE METHODS OF ACTUALLY SHARING THESE SYSTEMS</u>.

Shared applications have the advantage of avoiding duplication of development and maintenance, and increasing the availability of information. Resources needed to maintain the system are minimized. The problem with such systems has been the difficulty of making them responsive to special needs of individual users.

Shared systems are not new. The Central Accounting System, Payroll and Personnel Systems have been used by many agencies for many years. Higher Education has had variations of the same accounting system for many years. Recently all Community Colleges have cooperated to adopt HEFAS, the <u>H</u>igher <u>E</u>ducational <u>F</u>inancial <u>A</u>ccounting <u>S</u>ystem, which is basically the same package used by the University of Colorado and Colorado State University.

In 1977 a joint venture between the Department of Administration, Personnel, and the Office of State Planning and Budgeting was begun to develop the Colorado Management Information System (CMIS). The objective of CMIS is to develop a common data base for Personnel, Payroll, Accounting and Budgeting purposes. The new Personnel Data System for classified personnel was finally installed in 1982. The interfacing Applicant Data System will be installed in 1983, as a result of a contract to install that package product. It was previously installed in Alaska.

The Payroll portion is presently in the process of design definition. The Central Accounting System is being studied and given some badly needed revisions to make it more efficient and maintainable until a permanent replacement is developed. Personnel from various agencies will be asked to participate.

5.   Performance Evaluation and Capacity Planning

ASSURE PERFORMANCE MEASUREMENT CAPABILITIES ARE ESTABLISHED AND UTILIZED BY ALL DATA PROCESSING ORGANIZATIONS.

The Division of ADP will continue to make computer hardware performance evaluation available to State agencies as long as a hardware monitor is available. The TESDATA 1155-B is obsolete and no longer supported by the vendor. Parts are hard to obtain. Funds have been requested for a modern replacement. If not funded, this capability will soon not be available. In the meantime, it is used sparingly, usually upon request.

Software for monitoring performance and predicting capacity is now beginning to be used also. It is becoming more useful as a tool to project growth and the need for additional facilities. The disadvantage is the use of machine resources. The software has some limitations in what it can do, and is only as good as the data and estimates which go into it.

It is important to measure performance on a continuous basis, keeping the systems tuned, and identifying problems early before they result in unacceptable service to users.

Performance evaluation tends to concentrate on the hardware resources used, rather than on the applications being processed. To relate the resources consumed to the applications consuming them is a primary objective. It is expected that as much as 80% of the resources may be consumed by as little as 20% of the applications. This is the 80-20 rule. Beginning with the 1982-83 fiscal year the Division of ADP has revamped its performance evaluation team in preparation for the evaluation of applications in this 20% category. It is hoped that inefficient and costly applications can be identified for correction action, or even elimination.

6.   Personnel

EACH AGENCY SHOULD IDENTIFY AND PURSUE AREAS OF NEED IN DATA PROCESSING TRAINING.

Data processing continues to develop new technologies and techniques at a rapid pace. The development of effective and efficient systems, quality products, requires well trained personnel working with incentive. It has been shown that capable people are attracted and retained where good training and the challenge to develop state-of-the-art systems are present.

Unfortunately, professional development has not kept pace with the needs. This has been largely due to two things: (1) Weak Management Commitment, and (2) Lack of funds.

Over the years the State has acquired and maintained videotape courses and equipment, and encouraged their use. In addition, seminars offered by vendors at no charge to the State have been utilized where possible. The State also conducts some seminars for ADP managers for training and sharing of information. Future efforts will be made to see that training requirements are adequately met through the Department of Personnel's training programs. Each agency, however, must still identify its needs. Some areas are very specialized or vendor dependent, and not suitable for generalized training programs. It will be more effective to handle those situations through the individual agency.

7. Higher Education

The Educom Report, Volume III of the 1979 ADP Master Plan, contained the results of the study of computing in higher education in Colorado, and many detailed recommendations. Except for the recommendations related to basic organization and funding changes requiring legislation, the recommendations were all implemented in some form.

Sharing of applications is done on a voluntary basis. The obsolete equipment has been replaced. Coordination among the various institutions was begun through semi-annual ADP management and user information and training management seminars. The seminars have had 100% support.

Because of the change in budgeting methods in 1982-83 providing greater flexibility to each institution as to how appropriations are spent, the Division of ADP is currently developing modified methods for the Higher Education ADP planning, budgeting and operations functions.

SECTION III

TRENDS AND EMERGING ISSUES

A. Introduction

Technological advancements in electronics are continuing at a
rapid pace. Equipment costs continue to drop, while their capabili-
ties increase. At the same time, personnel costs continue to rise.
More and more managers are turning to data processing as a way to
increase productivity. Funding ADP is an ongoing issue.

Technological change has been most evident in the following areas:

o Microcomputing
o Office Automation
o Data Communications
o High Density Disk Storage

In the midst of all the change there is more demand than ever for
the data processing professional. The DP manager is caught between the
shortage of qualified systems analysts and programmers, and the need to
hold the line on budgets, while the demand for new systems grows. It
is not unusual to have a two or three year backlog of requests.

The user, unable to get quick response from the data processing
specialists, is looking to personal computers and word processing
systems that he can completely control himself.

This section is intended to inform managers of the changes taking
place so they can better plan for the future.

B. Microcomputing

The list of vendors marketing microcomputers is growing rapidly.
From Altos to Zenith, take your pick. The Osborne 1 at $1,795, com-
plete? One of the big names, like IBM or Hewlett Packard? For games,
would you like Atari, Texas Instruments or Radio Shack?

When you have selected it, do you need extra memory? More disks?
Special communications boards? A printer? A TV monitor screen? Other
special hardware options?

What software do you get with it? Is the operating system CP/M,
DOS, or what? What packages do you want? Word Processing? Graphics?
Electronic Spreadsheet? Data Base?

What language should you use to program it? Basic? APL?
Pascal? RPG?

How do you learn to use it? Manuals? Tape Cassettes?
Tutorial programs?

What are you really going to use it for, and what can you expect
in benefits? Does it fit into the total information processing plans?
These last questions really need to be asked first. The answers will
direct you to the software needed, and then you will be able to select
the machine that supports that software. As all of these questions
show, it is not a simple case of select, buy, plug in, and run.

If you have been used to using a large computer you may find
using a micro restricting. If will be smaller, slower, and will not
offer as many features and options.

The micro will not solve a problem all by itself. The user must
put it to use. However, for the professional or technician willing to
work at it, the microcomputer offers a lot of potential. It is not
far fetched to expect the micro to eventually be as common as the old
desk calculator. Victor was a big name in calculators. Have you seen
their new micro, the Victor 9000?

Commercial advertising is slick, and makes everything sound easy
and cheap. But two things need to be recognized before you invest:

1. You are on your own. You have complete responsibility and
    need to know enough about your operation to use the equip-
    ment effectively.

2. You may be vulnerable. There are no automatic security
    features, or ties to other computer backup or data pro-
    tection procedures. Controls of access to, and the
    validity or integrity of data bases and programs must
    be provided where necessary.

If you have the qualifications and the need, and funds are
available, you can probably justify your request. But go in heads
up, and eyes open.

C. Office Automation

It used to be called word processing, but the automated office
does much more than that. Scheduling, electronic messages, filing
and graphics are just a few things it can do. Since last year's
State awards for the four levels of equipment (stand-alone, non-
integrated small cluster, non-integrated large cluster, and integrated
system - network) several agencies have conducted cost/benefit studies
and sought equipment suited to their specific requirements. More will
be doing so.

New announcements indicate technical advances in two major areas
affecting growth in this field: 1) Local Area Networks (LAN) are
now becoming truly operational, and 2) Integrated workstations are
now available that can perform either data processing or word
processing functions. The line between the office and data pro-
cessing is disappearing.

Local area networks will be costly, but will be the link that
connects offices, interfaces with various kinds of equipment, and
makes possible the transfer of information electronically instead
of by paper.

Good planning and careful attention to the human factors and
organizational problems are essential if the best results are to
be achieved. Agencies must consider their total needs, and work to
integrate their current and future processes and functions. What
is taking place today is only the tip of the iceberg.

D. Data Communications

The costs for Bell System communications facilities are rising
sharply (See II-A-3, Exhibit II-F). The demand for on-line systems
is also rising. The volumes of transactions processed will continue
to rise, especially between 8:00 AM and 5:00 PM. The growth intensi-
fies the problem of balancing workloads at the computer centers.

Agencies which are served by multiple computer centers need
easy access via a State network to avoid duplicated facilities,
and in some cases, duplicated workloads.

To meet the needs in this area the Division of ADP and the Division of Communications have a joint responsibility to develop plans for a State data network that will share resources in an efficient manner. Common routings, high speed lines, and development of data circuits on the State microwave network are some of the ways these challenges will be met.

As new circuits are added and the complexity of the networks increases, it will become increasingly costly to users to have service interruptions. More communications specialists, equipped with the hardware and software to identify and fix network problems, will be needed to maintain the networks.

The growth in the networks, and the use of new technologies will render much of the older State owned terminal and modem equipment obsolete. In some cases the costs of communications and equipment replacement will have to be balanced against possible alternatives, such as mini or micro-computers.

At some point in the future it is possible that satellite communications channels may become available, but that isn't in the near future.

Integration of the data and voice communication will become common. The use of local area networks and automated digital PBX's will make this possible.

The biggest deterrent to progress in this area will be the shortage of qualified people to plan, implement, and manage the needed facilities.

E. Application Software Backlogs

The State has many systems that have been around for a long time. Like an old suit, they can be patched until they finally wear out, then they have to be replaced. The patching process ties up systems development staff and prevents work from being done on new systems. Changes take longer to make because the programs have been so modified since they were first written that their logic is extremely difficult for any programmer to follow.

Replacing key applications can take months and years, since they have grown over the years and consist of many programs, involve many departments and people, and consume a lot of resources, both people and hardware.

Often data processing managers do a fine job of keeping key applications running long after replacement is indicated. Faced with a budget squeeze a DP manger often takes measures to extend the life of applications, which can ultimately result in harm to the operating capabilities of the organization. The old applications become inadequate and inefficient, and take more resources to maintain, while needed new applications are delayed.

Rarely do top executives realize soon enough that there is a problem. Often more powerful hardware will strengthen the belief that DP is keeping up. Since it takes years for a system to deteriorate a sudden breakdown is rare.

There are three dangers connected with outmoded software:

1. Old software is risky technically.
2. It encourages competitive and alternate systems, while developing a bad reputation for itself and the organization.
3. It is not cost effective.

The danger of a technical breakdown at a key point is real. Perhaps the volume simply exceeds the original design specifications and everything halts. But in any case you can be sure that the time frame to take corrective action will be greatly compressed.

When users find an obsolete application doesn't meet their needs, they will seek to bypass it, develop an auxiliary system (either manual or automated), or even ignore it. Central controls and confidence in the system are jeopardized. Costs of making the old system work mount, and so do costs associated with manual or auxiliary systems. The application loses its cost effectiveness.

In planning for systems development agencies should prepare a plan that includes replacement of key applications, as well as the usual changes and requests for new systems.

To reduce the systems backlog some users are seeking to use micro-computers and word processing equipment. These systems will become more common and will be integrated into local area and main-frame networks. Users will be able to do many ad hoc reports that previously required programmers. The word processing systems being acquired by the State today have sort, list processing, and math packages that can satisfy many requirements. The communications links to the computer, however, are not yet in place.

For the data processing professional there is still a need to increase productivity. High level languages, purchased packages, structured programming, and other techniques are useful, but do not constitute a major breakthrough. Predictions of automated programming still have a long way to go to become a reality. In the meantime the State needs to acquire and retain skilled analysts and programmers, and use whatever tools and techniques are available to shorten the systems development time.

There are no easy answers to the systems backlog problem. It will continue indefinitely. There is just one thing that must be re-cognized: A penny-wise approach to data processing that delays needed systems development and replacement, and increases the systems backlog, is risky and could be very costly in the long run.

F.   Funding the Plan

Providing adequate funding for the approved ADP plans of the computer centers and their users is an ongoing issue. It is not a problem unique to the State of Colorado. In DATAMATION'S 1982 Budget Survey (May, 1982) 54% of all respondents agreed that their data pro-cessing budgets were affected by the adverse economy. The average increase reported was 7.3% above 1981 figures. This is essentially no growth, since it is less than the probable inflationary increase for one year. Educational institutions were the only sector for which the DP budgets were down in 1982 - by 31%, but even they expect an average rise of 12% in DP employment.

When broken down by size it turns out that small users (with annual budget under $500,000) plan an average reduction of 8%, while the largest users (with annual budgets over $1 million) expect an average increase of only 4.3%.

The skewed overall average is the result of a relatively small number of medium sized users (with annual budgets between $500,000 and $1,000,000) planning sharp increases of up to 50%.

The 1982 survey shows that 21% of the average respondent's total DP spending for the organization is outside the DP manager's control. This "off-budget" spending is either not included in the DP department's budget, or is accounted for by transactions in which the DP department figures merely as the purchasing agent for some other part of the organization. This off-budget spending is expected to increase this year by a modest 11%. Government is least affected by off-budget spending, going from only 8% in 1981 to 9% in 1982.

In the category of personnel, manufacturers show the lowest average personnel spending (33%) in relation to the total DP budget. Government is highest in the personnel area with 47%, and Educational Institutions is roughly 41%.

By contrast, government spends the least on software, roughly 2%, compared to roughly 4% for educational institutions. The average for all respondents was 10%.

A further breakdown of the hardware category shows only slight changes:

	AVERAGE DP BUDGET	
	1982	Change from 1981
Mainframe	23.5%	-2.5%
CPU's, Memory	8 %	-4.7%
Mini's	13 %	-1 %
Micro's	4.5%	+ .5%
Peripherals	22 %	na
Misc.	16 %	na
Data Communications	5 %	na
Word Processing	5 %	na
COM	3 %	na

A breakdown of the 1982 average software budget shows:

Operating Systems	32%
Specialized Packages	19%
Compilers	10%
Systems Software	8%
Data Base Management	8%
Misc.	23%

A definite change has taken place in software buying patterns:

Source	1981	1982
Mainframe Vendors	48%	42%
Independent Suppliers	40%	45%
Mini/Micro Mfr.	13%	13%

In this case government is bucking the trend. Government's share to independents is down.

When the respondents were asked if their recent experience was in line with the trend toward greater emphasis on data communications, some 55% said yes. Retailers and distributors (83%) and government (69%) led the way.

Long-range expectations of budget change over the next five years are:

Unchanged	50%
Significantly Higher	42%
Significantly Lower	8%

Large users were less inclined than small ones to expect change. Higher personnel cost (36%) led the way as the reason cited for expected increases. Only 17% cited "more applications" as the reason.

Such a survey is somewhat useful in putting Colorado's future budget expectations into some perspective.

First, budgets will probably stay the same, or rise very little. Since the government sector spends more for personnel than other sectors, rising salaries will be the likely factor in the rise.

Second, the government sector spends the least on software. Colorado has tended to increase spending for software, but perhaps could do more and have a beneficial impact on application backlogs at the same time. This could hold down increases in personnel, and offset the pressure to increase budgets.

Third, large installations like the major computer centers Colorado has established appear to be more stable, and better able to hold the line on costs. The survey shows that small units get cuts, possibly because they do not contribute as much, or because they have low organization commitment. Medium sized installations predict sharp increases, possibly indicating management supports the spending for data processing in order to save money overall. (Such a comment was made by an executive of a large conglomerate in the DATAMATION survey.)

Fourth, there is a definite trend to more decentralized or distributed processing, as evidenced by survey respondents, and by the plans of Colorado agencies. This will have the effect of pushing State DP budgets higher.

Fifth, the survey indicated zero for word processing in government DP budgets. Colorado appears to be ahead in this area, having already taken steps to insure that word processing and office automation are included in data processing planning. However, much of this spending may be "off-budget" to DP. These costs will go up, pushing budgets up.

Sixth, off-budget spending is minimal in the government sector, but is growing. It will continue to grow, but if adequate planning and coordination takes place off budget spending can be part of the ADP plan.

Seventh, spending for micro's is the hardware category that is rising. We can expect it to rise still more, pushing DP budgets up.

Eighth, hardware costs overall are falling, and will help to offset other rising costs.

Ninth, the government sector, including Colorado, has strong ties to mainframe vendors, and obtains much of their software from them. The overall trend is toward independent suppliers. Perhaps more effort is needed to identify and obtain the benefits from the independents which the rest of the industry seems to have found.

Tenth, and last, data processing is an entrenched part of any organization, but shows some signs of losing its innovative character. This must not be allowed to happen. Some place must be found in budgets for testing and implementing new technology. It would seem that government, perhaps in cooperation with the colleges and universities is a good place to learn how to do this.

Adequate funding for data processing is an ongoing issue, and essential for continued progress.

SECTION IV

CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

The recommendations and planning objectives of past ADP Master Plans that were presented in Section II, Status, are still valid. However, they will not be repeated here. Except for a few major issues that require re-emphasis or modification the items presented here are for current issues and reflect the analysis of the agency plans (Section V and VI), Trends and Issues (Section III), and the perceived collective needs of all State agencies and branches of government.

In order to assist the reader in locating areas of primary interest to him, the issues and recommendations are arranged in the same order as in Section II:

    A. Planning and Budgeting
    B. Computer Facilities
    C. Data Communications
    D. Information Management
    E. Performance Evaluations
    F. Personnel
    G. Higher Education

A.   Planning and Budgeting

Problems associated with the planning and budgeting process (Section II, page 30), indicate that the planning process needs more emphasis on long-range planning, and that agency plans and budget requests need to be better timed and coordinated.

Considerable effort goes into the preparation of a good long-range plan. So much, in fact, that it simply isn't done every year. A long-range plan is important, and no agency should be without one, but neither is there any benefit from expending resources unnecessarily if there is no change to the existing plan.

A long range plan, by definition, is for 3, 4, or 5 years ahead. It does not need to contain great detail, but must contain goals, objectives, and milestones by which progress can be measured. Conversely it need not be delayed in preparation and submission to the Division of ADP because of uncertainty of current budget processes. That is a short-range or tactical planning problem.

RECOMMENDATION A-1

ALL DEPARTMENTS, INSTITUTIONS, AND AGENCIES SHOULD FURNISH LONG-
RANGE PLANS TO THE DIVISION OF ADP BY APRIL 1 OF EACH YEAR, OR
A STATUS REPORT ON PROGRESS IN IMPLEMENTING THE STILL CURRENT PLAN.

RECOMMENDATION A-2

ALL DEPARTMENTS, INSTITUTIONS, AND AGENCIES SHOULD FURNISH SHORT-
RANGE (CURRENT AND BUDGET REQUEST YEAR) PLANS TO THE DIVISION OF
ADP BY AUGUST 1 OF EACH YEAR. THESE SHOULD INCLUDE UPDATED
SPENDING PLANS ACCORDING TO THE CURRENT YEAR'S APPROPRIATION, AND
PRIORITIES AND JUSTIFICATION FOR NEW SPENDING ITEMS PLANNED FOR THE
BUDGET REQUEST YEAR.
(NOTE: A new format will be provided by the Division of ADP for
        the August, 1983 submission.)

In view of the difficulties experienced with the tracking of pro-
grams through the planning and budgeting cycle (Section II, page 31)
the general conclusion is that the State needs a complete new budget
system that will meet the needs of all segments. This is an activity
previously envisioned as part of the Colorado Management Information
System (CMIS).   CMIS has only just succeeded in initial implementation
of the Personnel Data System for classified employees, and is beginning
to develop a new central payroll system. Various State agencies are
developing their own budgeting support system. It would seem that now,
not later, is the time to get started. This is a major project, and will
require the cooperation of all agencies and branches of government. It
will also require a dedicated team composed of both data processing pro-
fessionals and management representatives from the Legislature, OSP&B,
Higher Education, the Department of Personnel and the Divisions of
Accounts and Control and ADP. If this project were started now it would
take months to study possible alternatives. The possibility of finding
a system in use in another state needs to be investigated. In view of
the huge investment in preparing and submitting the budget each year,
the potential savings are almost impossible to estimate.

RECOMMENDATION A-3

CREATE A TASK FORCE COMPOSED OF MEMBERS FROM THE DIFFERENT BRANCHES
AND HIGHER EDUCATION TO REVIEW THE CURRENT PROCESS, STUDY ALTERNATIVE
WAYS TO SIMPLIFY THE STATE BUDGET PROCESS, AND RECOMMEND SELECTION
OF A SINGLE SYSTEM.

B.   Computer Facilities

Progress in establishing the major computer centers has been steady, well supported, and has resulted in major savings. However, the original goal of developing two major centers, General Government Computer Center and Financial Management Computer Center, to serve as backup for each other and to more evenly distribute the workload has not yet been achieved.

RECOMMENDATION B-1

CONTINUE DEVELOPMENT OF THE FINANCIAL MANAGEMENT COMPUTER CENTER AT THE DEPARTMENT OF REVENUE.

Large multi-user computer facilities have proven to be a cost effective way to provide powerful and sophisticated data processing service to small users that otherwise could not affort it. The use of distributed processing has oversome some disadvantages of centralized facilities. Medium sized installations, however, seem prone to grow into large centers, to provide that level of service. This has proven to be very cost intensive.

RECOMMENDATION B-2

AVOID CREATION OF MEDIUM SIZED COMPUTER CENTERS AND RELY ON LARGE CENTERS AND COMMUNICATIONS.

Microcomputers may revolutionize the data processing industry. It is desirable to exploit this new tool, but it should be used to enhance the management of information, and not to confuse and frustrate the efforts to protect data, insure its validity, and make it available to all levels of management that need it.

In higher education, and in some executive branch agencies, micros are beginning to be used in user work areas or "computer labs". These supervised areas, with training of the user, scheduling of time, and monitoring of results offer the best opportunity to experiment with this new tool.

RECOMMENDATION B-3

ENCOURAGE THE USE OF MICROCOMPUTERS IN CONTROLLED ACCESS ENVIRONMENTS, SUBJECT TO APPROPRIATE SECURITY MEASURES, AS THE BEST WAY TO DEVELOP EXPERIENCE IN THE USES OF THIS DATA PROCESSING TOOL.

C.   Data Communications

     A critical need exists for a suitable long-range plan to provide
essential data communications facilities and services to all State
agencies. The expected increases in Bell System tariffs call for
immediate action to minimize costs. One of the ways to do this is to
expand the data handling capabilities of the State microwave network.

     RECOMMENDATION C-1

     EXPAND THE DATA CIRCUITS ON THE STATE MICROWAVE NETWORK WHEREVER
     THIS IS MORE COST EFFECTIVE THAN BELL FACILITIES.

     RECOMMENDATION C-2

     THE DIVISION OF ADP AND THE DIVISION OF COMMUNICATIONS SHOULD CON-
     TINUE TO PLAN FOR A STATEWIDE COMMUNICATIONS NETWORK TO SUPPORT
     DATA, VOICE, IMAGE, AND FUTURE TECHNOLOGY.

D.   Information Management

     In the 1981 ADP Master Plan, Appendix G, the topic of information
management was discussed with particular attention to Colorado Management
Information System (CMIS) as a data system to provide information at the
State level for monitoring and reporting management goals and objectives,
and for meeting prime user needs in the areas of Personnel, Payroll,
Accounting, and Budgeting. In addition, a second phase would include
information about the private sector.

     The plan also addressed the working group of users of geographical
data, which would develop a plan for the long-range use of such data.

     Progress has been slow, and CMIS has only succeeded in implementing
a central personnel data system (PDS) for classified employees. Exempt
employees still have no common system. Work is just starting on the
central payroll system, and no real work has begun on the accounting and
budgeting phases. Because of the slow progress this plan has already
included a recommendation for creation of a task force to study the
budget problem (See Recommendation A-3).

The objectives of CMIS are still sound, but they seem far from being achieved at this time. In fact, the Personnel Data System base does not appear to be complete, since no effective way to include exempt employees has been found. Colleges and Universities continue to maintain their own personnel systems.

There is no easy answer to the problem of what data items or data formats are needed by the State. A rather obvious conclusion is that unless some rationale for a central data base exists, there will never be one. Prime users want to continue "having it their way", and are entitled to their own provincial system if no adequate alternative or rationale exists. If no effort is made to define the requirements for a central State data base then the resulting elements of data and their structure will remain at the user level.

RECOMMENDATION D-1

ESTABLISH AN INFORMATION MANAGEMENT TASK FORCE TO DEVELOP A CONCEPTUAL DESIGN AND RATIONALE FOR DATA BASE ELEMENTS AND STRUCTURES NEEDED TO SUPPORT COMMON MANAGEMENT DECISION-MAKING AT DEPARTMENTAL AND STATEWIDE LEVELS.

The list of colleges and universities using HEFAS (Higher Education Financial Accounting System) continues to grow. The Central Accounting System (CAS) is an outmoded system that is costly to maintain and needs to be replaced. However, replacement of such a key application is likely to be both costly and time consuming. HEFAS, designed for higher education, undoubtedly would require major changes to be adapted for use by executive departments. Extending the features of HEFAS to executive departments would also require careful consideration of the policies and procedures involving the Division of Accounts and Control and executive departments, some of which already have developed extensive accounting systems of their own. The general acceptance of HEFAS, and its many features, suggest that it would be a good place to start in looking for a replacement for the Central Accounting System.

RECOMMENDATION D-2

CONDUCT A FEASIBILITY STUDY AND COST/BENEFIT ANALYSIS OF MODIFYING HEFAS FOR USE BY EXECUTIVE DEPARTMENTS.

E.   Performance Evaluation

When the Division of ADP was engaged in the continuous review and
evaluation of approximately 21 computer facilities the frequency of
evaluation at a facility was estimated at about once every seven years.

With the emphasis now placed on the need to review and evaluate the
suitability, efficiency, and benefits of applications; the frequency of
facility evaluations will drop even further. In order to assure that
some evaluations are made, some sort of self-analysis of the facilities
by their own staff should be established.

RECOMMENDATION E-1

COMPUTER CENTERS, WITH THE HELP OF THEIR USERS, SHOULD PERIODICALLY
CONDUCT SELF-EVALUATIONS TO DETERMINE THE ADEQUACY AND USER SATIS-
FACTION OF THE SERVICES PROVIDED, AND ASSURE THAT THE CENTER IS IN
COMPLIANCE WITH STATE STANDARDS AND ANY POLICIES AND STANDARDS SET
FOR THE CENTER. SELF-EVALUATIONS SHOULD BE SCHEDULED IN THE CENTER'S
PLAN, AND REPORTS OF THE RESULTS FILED WITH THE DIVISION OF ADP.

As the number of applications which may need to be evaluated is
vastly larger than the number of computer facilities, it is obvious that
the staff of the Division of ADP itself will never be able to get around
to all the applications that should be evaluated. Also, since the selec-
tion of the applications to be evaluated is based upon the usage/capacity
planning activities, the two functions should be tied together in a plan
to insure that all centers and all major applications can be covered.

RECOMMENDATION E-2

EACH COMPUTER CENTER SHOULD INCLUDE IN ITS PLAN THE REQUIREMENTS
TO STAFF AND FUND AN ON-GOING PROGRAM TO MONITOR RESOURCE UTILI-
ZATION BY USER APPLICATION.

RECOMMENDATION E-3

EACH COMPUTER CENTER SHOULD SUBMIT TO THE DIVISION OF ADP, ALONG
WITH THEIR SHORT-RANGE PLAN AND BUDGET REQUEST, A LIST OF FIVE
HIGH-USAGE APPLICATIONS SUGGESTED FOR THE DIVISION OF ADP TO
EVALUATE.

Based on recommendations E-2 and E-3, the Division of ADP will be able to plan for the eventual monitoring of resource utilization at all computer centers, and select the most likely applications for detailed evaluation.

F.   Personnel

A major need is beginning to surface in all data processing areas where data communications networks are in heavy use. That is the need for someone to be in charge of the network. When there is a network problem someone has to locate it, identify it, and correct it.

At this point in time no standard classification, job skills, training, etc., have been identified for this function and it is per-formed by a variety of classified employees. In some cases the function is divided among the vendors' maintenance personnel, risking finger pointing and extra maintenance charges by those vendors that are called in, but whose equipment is not at fault. In other cases, the network maintenance is contracted out to a service organization that assumes complete responsibility.

RECOMMENDATION F-1

DEVELOP REQUIREMENTS FOR A DATA COMMUNICATIONS SPECIALIST CLASSI-FICATION AND SEEK THE ESTABLISHMENT OF SUCH A CLASSIFICATION FROM THE DEPARTMENT OF PERSONNEL.

G   Higher Education

A review of the individual college plans show a wide range of capabilities and experience. Each institution seeks to meet the growing demand for education in the ADP/computing field, but there the simil-arity ends. Schools like C.U., CSU, and CSM, have much more capability than the small community colleges.

It seems desirable to encourage the small schools to seek a closer cooperation and working relationship with larger institutions. Large mainframes are still too expensive for small schools, but the small schools would benefit if a communication link to universities were available. The sharing of costs should be mutually beneficial. Engineering, graphics, and a whole range of cooperative options might be shared if the instructional programs could be coordinated.

RECOMMENDATION G-1

ENCOURAGE SMALL INSTITUTIONS OF HIGHER EDUCATION TO SEEK COOPERATION AND DEVELOP COORDINATED PROGRAMS OF INSTRUCTION WITH LARGER INSTITUTIONS TO IMPROVE QUALITY AND MINIMIZE DUPLICATED FACILITIES.

The plan for a new mainframe computer to be installed at Metropolitan State College is not supported by the Division of ADP. The whole Auraria Higher Education Center should be considered in any plan to place a mainframe computer in that area. The needs that prompted the plan by MSC may be valid, but should not be taken in isolation. A careful study of the needs of all the schools at Auraria, and possible alternatives, is needed.

RECOMMENDATION G-2

CREATE A TASK FORCE TO STUDY THE NEEDS OF CCD, MSC, AND UCD AT AURARIA, AND MAKE RECOMMENDATIONS CONCERNING THE CREATION OF AN AURARIA COMPUTER CENTER.

SECTION V

AGENCY PLANS OVERVIEW

INTRODUCTION

The plans submitted by individual State agencies to the Division of ADP are varied, and some are as large or larger than this Master Plan. The agency plans have been briefly summarized in this section of the Master Plan. For anyone interested in more detail, the complete plans are available for inspection in the Division of ADP.

Inclusion here does not indicate approval by the Division of ADP. Approval or disapproval of agency plans will be conveyed by direct communication with each agency in the normal process of coordination. Any exceptions of major importance are included in Section IV, Conclusions and Recommendations. The reader should see Volume 2 for funding recommendations.

PLAN OVERVIEW

DEPARTMENT OF ADMINISTRATION

The 1983-84 departmental priorities, excluding the General Government Computer Center are:

1. <u>Overhaul the Central Accounting System</u> - a technical refurbishing to assure continuous operation.

2. <u>Central Payroll and Labor Distribution</u> - to replace the existing system, continuing Personnel/CMIS development.

3. <u>Computer Applications Inventory</u> - a new system to monitor all data applications.

4. <u>Automated Purchasing System</u> - a new system to replace manual systems.

5. <u>Upgrade Central Services System</u> - to improve billing and control of material in Central Stores.

6. <u>Accounts Receivable System</u> - to be linked to the Central Accounting System (CAS) and Higher Education Financial Accounting System (HEFAS).

7. <u>Accounts Payable System</u> - to be linked with CAS.

8. <u>Computer Hardware Monitor</u> - to replace the obsolete TESDATA 1155-B for which service is no longer available.

Not included in departmental priorities are the GGCC plans for two new support systems:

1. <u>Billing System</u> - to replace the often criticized system used for over ten years.

2. <u>Disk Management System</u> - to provide efficient control, accountability, and cost of disk resources.

No support for agency plans was included in the GGCC plan due to lack of information at the time the plans were prepared. However, the capacity planning study and previously approved systems development clearly show that continued growth requires additional processing power, disk storage, and communications capability, or other alternatives must be found.

PLAN OVERVIEW

COLORADO DEPARTMENT OF AGRICULTURE

The Department of Agriculture is looking to automate the office and clerical functions using in-house micro-computer and/or word processing equipment. The department's primary activity in the data processing area is the licensing of various agricultural programs. The department feels that the list processing capabilities provided by word processors will satisfy the needs in this area plus provide the ability to automate the office in the clerical and secretarial areas. The department's current equipment consists of a Datapoint 1800 and a Radio Shack Model 16. Both systems are in the "micro" class of computers. The Datapoint is used for feeding the Central Accounting System and for licensing functions for Pesticides and Farm Products. The Radio Shack computer is used to interface with AG/NET (an agricultural data base) and various other small applications such as mailing lists, etc.

The Brand Board is responsible for registering all brands in the State. They have a requirement to publish a Brand Book every five years showing all registered (30,000) brands along with their owners, in sequence by brand. Renewal applications must also be sent every five years concurrent with the preparation of the book. They are currently handling this application on addressograph equipment which is no longer supported, and the metal used for the plates is no longer available. They will be looking into the possibility of automating this application.

PLAN OVERVIEW

DEPARTMENT OF CORRECTIONS

This department is served by the Administration of Justice Computer Center (AJCC) and the General Government Computer Center (GGCC). In addition, some administrative support systems are still being processed and maintained at the Institutions Computer Center at Pueblo. This, and the geographic dispersion of correctional facilities creates a major communication problem for this department. They rely on the computer centers and the Division of ADP for technical help in this area, and would be a prime beneficiary of a State communication network.

Essential elements of the ADP Plan are:

1. Completion of an expanded telecommunications network for all Corrections Facilities and Community Service Regional Offices.

2. Further enhancement of existing applications to meet specific requirements of management and staff.

3. Authorization of additional systems analysis and programming staff required for development of new automated applications.

Planned enhancements will be handled by existing systems and programming staff, which consists of just one systems analyst and one programmer. Three additional FTE will be requested for new applications.

ENHANCEMENTS

1. Central Accounting System - additional summary reports from year-to-date files from GGCC.

2. Offender Data Base
   - 20 to 30 more terminals
   - Move data entry to terminals in primary user area
   - More reports to "feed back" data to users
   - Add Medical Alert and Mental Health data to data base
   - Expand to include parolees.

3. Inmate Banking - install at Buena Vista via terminal to UTS 700 at Canon City.

4. Warehouse Inventory - add remote data entry and on-line inquiry. Requires ICC support, since system runs there.

5. Report Distribution - convert voluminous reports from paper to microfiche.

NEW APPLICATIONS

6. Pharmacy System - mini/micro package to provide inventory control, inmate drug profile, chronic medical problem listings, and automated typing of prescription labels.

7. Food Services System - to provide (a) automated calculations of quantities of ingredients based on portions served from stored recipes, and (b) inventory control.

8. Tag Plant System - Order recording and tracking for license plates from 63 counties of Colorado.

9. Cost Accounting - by end product, for Correctional Industries' 18 work centers.

10. Vehicle Maintenance System

11. Staff Training System - provide information and statistics required per ACA standards and SB 308.

The Department of Corrections ADP Advisory Group will be asked to prioritize these applications requirements and set direction in view of the limited systems development staff available.

PLAN OVERVIEW

DEPARTMENT OF HEALTH

In addition to maintenance of 35 active applications, plans for 1983-84 include the completion of programming and implementation of three systems currently under development, and substantial enhancement of four. Phase I of a 5 year plan for development of the Air Pollution Data Handling system will be started.

To be completed:

> Health Care Facilities (ADABAS)
> Water Quality Permit System (SB 10, 1981)
> Nursing Home Review and Inspection (Title XIX contract with CDSS)

To be enhanced:

> Handicapped Children System - financial eligibility, therapy auth.
> Vital Statistics - marriage module
> Radioactivity Analysis
> Milk System - forms changes

The new Air Pollution System follows a legislative funded design and study by Arthur Young and Co. It will involve a new minicomputer operating in conjunction with GGCC's IBM 3033 mainframe.

PLAN OVERVIEW

DEPARTMENT OF HIGHWAYS

The current fiscal year plan involves studies in the following areas:

1. <u>Microcomputers</u> - where do they fit in. A consultant will assist in the study, and in preparation of an RFP (Request for Proposals) for up to 6 micros.

2. <u>Mainframes</u> - required by pressures for new applications and lack of resources at GGCC, CU, and in-house. An in-house mainframe upgrade may be requested. Service bureaus will be considered.

3. <u>Communications</u> - to address the need for a master communications plan for the Department. An RFP for a communicaions consultant has been prepared.

The short-range plan includes building a library of software packages for micros, a network connecting them to mainframes and each other, and an upgrade of the in-house HP3000 mini in anticipation of the Department's own mainframe.

The long-range plan includes:

1. Full implementation of an Integrated Graphics Systems (IGS), with workstations in district offices.

V- 6

AGENCY PLANS OVERVIEW

2. Acquisition of an Engineering Mainframe, and gradual migration of all processing from CU to Highways.

3. Acquisition of an Administration mainframe to replace the HP-3000 and all processing now done at GGCC.

Software plans include the Integrated Graphics for Computer Aided Design (CAD), participation with the State Controller in the development of a new Central Payroll System, an inventory control system, and a library of packages for micros. The MAPPER (Univac) package has been tested as one possible answer to the inventory requirement. Other alternatives are still to be considered.

Other software being considered:

PCMS   Manpower Modeling and Scheduling
RAP   Resource Allocation
BAMS   Bid Analysis Monitoring
MMS   Maintenance Management
HPMS   Highway Performance Monitoring
BARS   Bridge Analysis Rating
PMS   Pavement Monitoring
IRIS   Various Data Base Applications
PHS   Project History

PLAN OVERVIEW

DEPARTMENT OF INSTITUTIONS

The Department of Institutions has implemented a formal planning process which promises to help in serving the widely spread users, including some other departments. The Institutions Computer Center (ICC) at Pueblo provides some administrative system support to the Department of Corrections. ICC has also been the test site for MAPPER, a high level language usable by non-data processing staff. Both Corrections and the Department of Highways have done some development using it.

The long-range plan calls for more user involvement, and a web-like communications network to overlap the organization, regardless of geographic location.

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Direction will come from an ADP Policy Advisory Committee, assisted by a Key-User committee. The systems selected for development will be supported using professional staff and accepted controls and procedures.

The ICC Univac computer will be the hub of the network, which will link it with terminals and with micro or minicomputers. Down-loading of software and data, and better security software will be used.

In the 1983-84 fiscal year enhancements and new developments are planned for the following users' applications:

User/Application	Enhancement	New
Division of Youth Services:		
Client Data System - Various (Education, Medical, alias, and other records)	X	
Division of Dev. Disabilities:		
CORE - replacement		X
Programmatic accountability		X
Division of Mental Health:		
MHMIS		X
Automated MH Monitoring and Review		X
Colorado State Hospital:		
Forensic Psych. Res. & Qual. Assurance	X	
Patient Data Sys. (Child & Adol.)		X
Purchasing		X
Fort Logan MHC:		
Patient Census	X	
Staff Workload Monitoring		X

User/Application	Enhancement	New
Others:		
Client General Accounting	X	
Community Housing Info. Sys.	X	
Program Mgmt. (PMIS)	X	
Computer Sys. Utiliz. Reporting		X

PLAN OVERVIEW

JUDICIAL BRANCH

The Data Processing Services (DPS) Division of the State Court Administrator's Office provides automated data processing services to the State courts and some county courts in both on-line and batch processing modes.

DPS plans to continue enhancement of systems such as Alimony and Support/Registry, Budget, Statistics, and Personnel/Payroll. Planning also includes provision for new systems and replacement systems. This planning includes applications such as Statewide Jury Selection, Property Management, adn Appellate Court Case Processing.

Funding may be sought for additional personnel to accommodate the increased activity, and for additional disk storage, terminals, and communication equipment to support more fully the needs of the courts.

PLAN OVERVIEW

DEPARTMENT OF LABOR AND EMPLOYMENT

Division of Employment and Training

This year the Colorado Division of Employment and Training (CDET) submitted only a one year plan. This was due to the uncertainty of continued funding, uncertainty of programmatic requirements, and uncertainty of the need for improvement in automation efforts in succeeding years.

The Information Systems Section of CDET serves not only that division, but other divisions in the Department of Labor and Employment, including the State Compensation Insurance Fund (SCIF) and the Comprehensive Employment and Training Act (CETA). CETA superceded the Manpower Development and Training Act in 1971.

Honeywell 66/60 dual processor replaced the Burroughs 3500/4700 early in 1978, after conversion and parallel operations to assure trouble-free operation. It has been modified and served adequately since. However, the age and economics of maintaining older equipment is reason to cause the Division to include in this plan a request that the division of ADP consider a Request for Proposal (RFP) for the benefit of the Department of Labor and Employment this fiscal year. This would consider future needs for both batch and communications systems over the next several years.

The requirements for most applications are set by the Federal Government, and apply to all the states. Below is a list of the major systems, their subsystems, and the systems support FTE:

1. Unemployment Insurance System (UIS) - 10.0 FTE
    a. Benefits
    b. Tax Accounting
    c. Wage Data
    d. Miscellaneous/Extraction

2. Labor Market Information (LMI) - 2.0 FTE

    a. ES-223 In-Season Farm Labor
    b. OES Occupational Employment Statistics
    c. CES Current Employment Statistics
    d. LTS Labor Turnover Statistics
    e. Annual Planning Report

3. State Employment Security Accounting System (SESAS) - 1.0 FTE

    a. Common input
    b. Property Accounting
    c. Time Distribution
    d. Cost Accounting
    e. General Ledger
    f. Common Output

4. Manpower Operations Data System (MODS) - 3.0 FTE

    a. Job Bank
    b. Applicant Data System
    c. Employment Security Automated Reporting System (ESARS)

5. Work Incentive Program Reporting System (WIN) - 1.0 FTE

6. Balance of State/CETA Computer System (BAS/CETA) - Uncertain

7. SCIF Systems (See SCIF Plan Overview)

Applications identified for future modifications and enhancement are:

1. Unemployment Insurance:

   UI Benefits - Claimant Master File Redesign, started
               - On-line monetary determination, future

   Automated Non-Mon - On-line non-monitary expansion, 1983-84

   UI Tax - Redesign and fully automate, over next 5 years (Will
            search for available package from other states)

   Word Processing - Start with UI Administration and selected
                     units, future

   Interstate Claims Network - for future study

   Minicomputers - selected applications such as overpayment
                   accounting, future

2. Manpower Operations Data System:

   Veteran Letters - Letters and mailing labels now - manuals,
                     future

   Job Bank - Broaden job order search to give applicants a wider
              range for referral, future

            - Increase summary space to allow more detailed des-
              cription, future

   Mail Box - Change to allow correction of erroneous terminal
              address instead of message dump, future

            - Change to allow JSC management messages to go to
              specific terminal, future

   Applicant Search - Make search available on-line, future

Technical support services allow all applications to operate successfully over a variety of hardware and software. The Technical Support Section is responsible for a wide range of technological support. Areas identified for development and change are:

1. Data Communications - Increased tariffs require planning and evaluation of network alternatives.

2. Office Automation - Plan and implement department-wide facilities.

3. Change Management - Develop a system to provide acceptable audit trails of system changes.

4. Operating System Upgrade - Upgrade to current release of GCOS-3, and evaluate move to GCOS-8.

5. DDE/DMIV - Plan, evaluate and implement on Honeywell 66/60.

6. Security - Implement statewide telecommunications security system.

7. User Oriented Software - Continue to plan and implement user oriented report software, methods and procedures.

8. Desk Top Computers - Continue to plan and evaluate success of micro applications.

Because this installation is one of the major computer centers, two pages have been extracted from the agency's plan and reproduced on the following pages:

Exhibit V-A   1982-83 Current Utilization   CDET/SECTION II-C/Page 1
Exhibit V-B   TERMINAL COMPUTER COMMUNICATIONS
                    NETWORK   CDET/SECTION II-D/Page 1

COLO. DIV EMPLOYMENT AND TRAINING
ADP MASTER PLAN

EXHIBIT V-A

II. CURRENT STATUS

C. UTILIZATION

The CDET computer center utilizes the above equipment 5
days per week, 3 shifts per day. When workload or dead-
lines require, the computer center, basically the 66/60 and
associated peripherals, are staffed on weekends.

The current (FY 82-83) utilization including weekends, by
device(s) is as follows:

Central Processing Units	77%
Memory (1024 K characters)	64%
Disk Channels	48%
Disk Storage (10,108 M characters)	54%
Tape Channels	33%
Printers connected to 66/60	29%
Xerographic Printers (1200 and 9700)	30%
Level 6 Printers (300 Line/600 Line)	20%

The utilization of various resources varies with the time
of day and the work being performed. Memory demands are
heaviest during the hours from 7:30 AM to 5:30 PM when ter-
minal usage by network users and programming staff is
greatest. Between 7:30 PM and Midnight, the Memory
requirements diminish somewhat due to the fact that some of
the TP executives are not in use, but the demands on the
CPU increase dramatically because of the initiation of
batch processing. From Midnight until 7:30 AM both CPU and
Memory usage are at the lowest of the entire 24-hour
period, being at approximately 70% of peak period usage.

From 5:30 PM to 7:00 AM all peripheral devices and off-line
printers begin heavy usage. The on-line printer usage
peaks about 2:00 AM and stays constant until 5:30 AM. The
off-line printer usage peaks about 11:30 PM then remains
constant until 7:00 AM.

1983 ADP MASTER PLAN

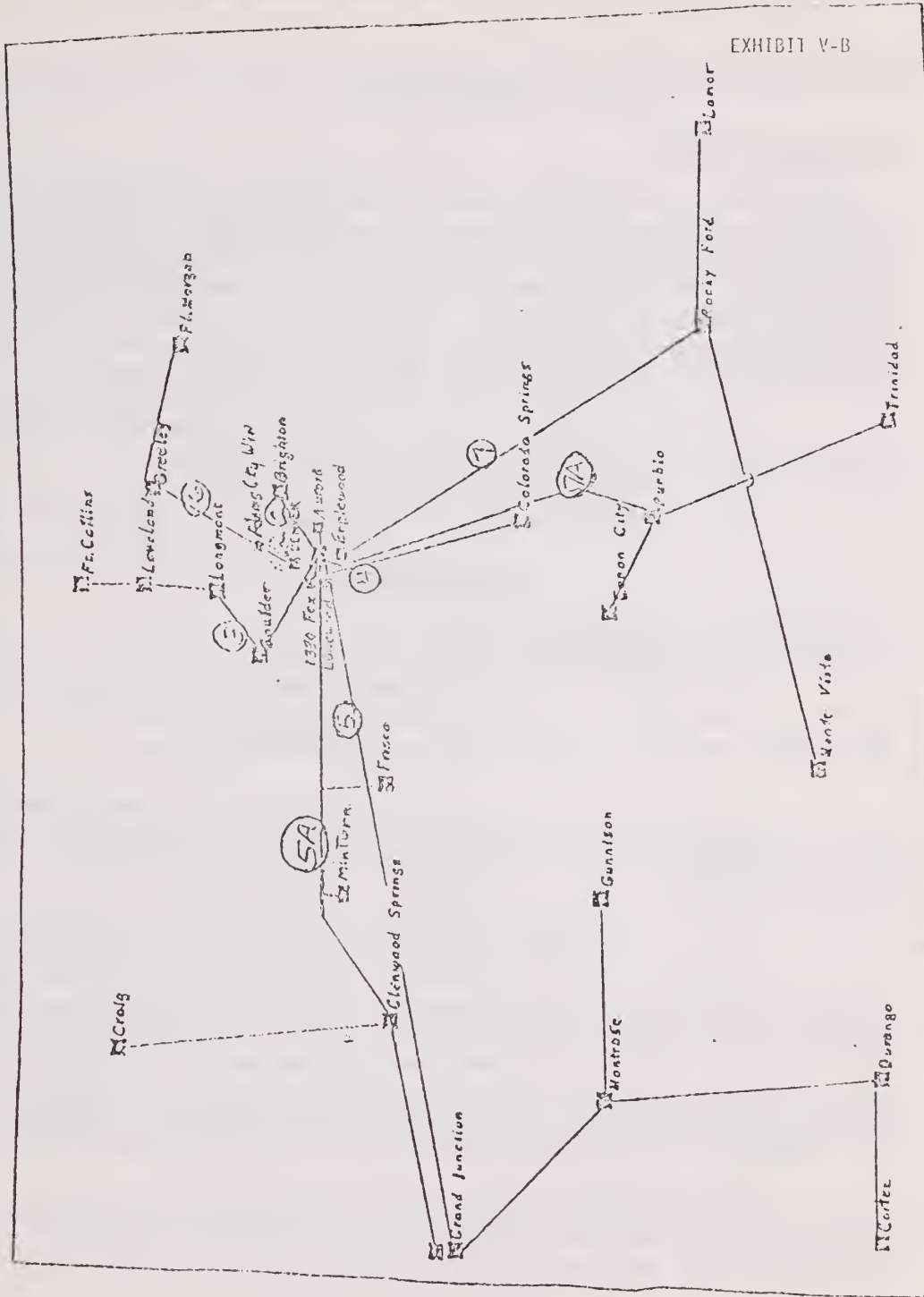STATE OF COLORADO

COLORADO

TERMINAL-COMPUTER COMMUNICATIONS NETWORK

EXHIBIT V-B

Colorado Department of Labor & Employment

CDLT/SECTION.II-D/PAGE I

PLAN OVERVIEW

DIVISION OF LABOR

This division is midway through the development of their Workers Compensation Management Information System (WCMIS). This is a distributed processing system, with terminals in Grand Junction and communications to the host computer at GGCC. Development began in the Spring of 1981, and will take three years to complete. The more than 400 data elements will be contained in a data base at GGCC using the ADABAS data base management software. The programming at GGCC will use COBOL and ADAMINT languages.

The distributed processor is a Four-Phase IV/60 and is programmed using VISION, the versatile language of the vendor.

The long-range plan will build upon this system for several years.

PLAN OVERVIEW

STATE COMPENSATION INSURANCE FUND

This agency receives its data processing services from the Honeywell 66/60 computer at the Division of Employment and Training. Systems development and data entry staff are located in-house.

Long-range plans include more distributed data processing and word processing. Branch offices are expected to expand and receive more staff and terminals. The branches will be able to give the same service as the main office.

SCIF must compete with and meet the same regulations as a private insurance company. To do so requires effective and efficient systems to support policyholders and claimants. Rate setting, billing, investments, accounting and reporting systems must change to meet new requirements. The basic claims and policy systems are now ten years old. Major legislation since 1973 has dramatically increased requirements. Coverage is now required for employers with only 1 employee, and for farmers. Coverage ceilings have been removed, and vocational rehabilitation has been included.

To meet these changes in requirements SCIF has outlined plans for systems changes and new applications extending into 1986-87, with a projected increase in ADP staffing up to 29 FTE.

The 1983-84 requests include additional resources to support the following systems:

Word Processing - equipment purchase		$ 75,000
New Premium Billing System	1.5 FTE	30,024
Daily Claims Processing	.5 FTE	8,448
Daily Underwriting System	.5 FTE	8,448
Policy Reporting	.5 FTE	8,448
	3.0 FTE	$130,368

The 1984-85 projection shows an anticipated need for development of the following applications:

Retrospective Rating - a cost plus expenses method based on losses for a large policyholder.

Experience Rating - an adjusted rate determined by the losses experienced compared to similar employers.

Claims Reserves - a replacement for the old system which is no longer adequate.

PLAN OVERVIEW

DEPARTMENT OF LAW

This department has a great need for fast, reliable data processing systems. To fulfill this need it is intended to acquire more hardware, software, and personnel. It is believed the need and the cost effectiveness of the hardware, software and personnel needed to implement our ideas and systems can be shown. New systems included in this plan are as follows:

1. Brief data base - Legal research of briefs written by the Dept. of Law.

2. Budget Accounting System - Current costs of personnel, expenditures and projected cost of personnel and expenditures.

3. Shoppers guide credit system. Publish monthly a list of institutions, and the types of loans with the annual percentage rate and other pertinent data.

4. Litigation Support System - Indexing and tracking all documents created by and received by the Department of Law.

Existing systems which are in a nearly constant state of enhancement and maintenance include:

1. Consumer complaint system
2. Docketing system
3. Time keeping system
4. Edit system
5. Uniform Consumer Credit Code
6. ALTER/SIRS
7. OCSF
8. BAS (budget accounting system)
9. MICRO/ALTER

PLAN OVERVIEW

DEPARTMENT OF LOCAL AFFAIRS

This plan includes data processing support for:

1. Division of Criminal Justice
2. Colorado Crime Information Center
3. Division of Commerce and Development
4. Division of Local Government
5. Division of Property Taxation
6. Division of Housing

The CCIC requirement will not be reviewed here, since a separate overview of the Administration of Justice Computer Center includes these requirements.

The Division of Criminal Justice anticipates extensive enhancements in 1983-84 of their data analysis capability by extending the court data base, adding data from the Prosecutor's Management Information System (PROMIS) and establishing a data base on adults held in local jails. Remote terminal access to SPSS and a high speed terminal downtown are desired, as well as two user terminals at AJCC.

The Division of Commerce and Development plans enhancement of word processing capabilities, with two more workstations; new development of systems using the Employment Security Act ES202 data base; and investigation of new ADP networks between divisions, especially the division of Local Government on local government finance and budgets.

The Division of Local Government plans enhancement to their Geo-processing system by full implementation of a graphic query system, linkages to other geographic information systems, and the National Cartographic Center products. These will place a heavier load on the central processor (25% when query is used); will require a small digitizer tablet or tie-up of three of present nine lines and more temporary on-line storage.

Other enhancements to Local Government applications include:

1. Local Government Fiscal Analysis - transfer from CU to on-site. Five megabytes of temporary storage required. Will save CU costs, travel, etc., for once or twice per year currently scheduled.

2. Water and Sewer needs - a tracking system for classifying water and sewer operations based on health, financial, and other needs factors.

3. Demographic Applications

    - UPED population projections model,
    - Increased use of census data, with most commonly used tapes transferred to disk.

The Division of Property Taxation plans are also mentioned in the AJCC plan. They include the following enhancements:

1. Apportionment of Public Utilities' property among counties,

2. Accumulation of abstract data,

3. Streamline sales analysis,

4. Exemptions subsystems - to be rewritten for better analysis and comparison.

5. Sales data - daily review and edit.

New applications for the Division of Property Taxation include:

1. Time/Cost Benefit Studies - Staff time reports by project,
    county, and planning region. In development now, it will
    require from 1.8 to 12.7 million characters of file storage.

2. Agricultural Land Valuation Calculation - should be operational
    in 1982-83.

3. Word Processing - multiple uses for various sections.

The Division of Housing plans to use existing census data and other
data bases from the Department's terminal, and has proposed inclusion of
additional data on housing and income from their division and from the Colorado
Housing Finance Authority. No specific usage requirements were given.

Departmental applications desired are enhancements to existing central
accounting systems and/or personnel systems for the benefit of managers.

Specifically:

1. FTE Tracking - budget and expenditure monitoring by position.

2. Management Report Format Generator - to allow each manager to
    generate his own report format and accumulate data in a hier-
    archial order for analysis.

3. Budget Projection Analysis - projection of historical data
    updated with personnel changes and predetermined price indices.

Long range plans anticipate the continued automation of manual systems,
and the enhancement of existing systems.

<u>PLAN OVERVIEW</u>

<u>ADMINISTRATION OF JUSTICE COMPUTER CENTER</u>

AJCC supports the Colorado Bureau of Investigation; Colorado State
Patrol; Department of Corrections; Department of Highways; Division of
Highway Safety; Department of Local Affairs; Division of Property Taxation;
Division of Local Government and the Division of Criminal Justice. The plan
is mostly a carryover plan, since the 1982-83 fiscal year funding contained
no new support. Utilization charts of this major center (Exhibit V-C)
on the following pages, are presented as they were contained in the AJCC
ADP Plan.

EXHIBIT V-C
AJCC UTILIZATION

1 of 4

COMPUTER UTILIZATION BY MAJOR COMPONENT

 - Expressed in Percent of Total Availability

	Actual 1981-82	Estimated 1982-83	Projected 1983-84
Central Processing Unit	19%	25%	30%
Core Storage	71%	75%	80%
Disk Storage	84%	104%	142%
Tape Access	25%	30%	35%
Printer	40%	45%	50%
Telecommunication Network	94%	100%	105%

Telecommunications Network Usage by User Agency

	Actual 1981-83	Estimated 1982-83	Projected 1983-84
Colorado Crime Information Center (excludes Colorado State Patrol)	87.89% (514)	88.00% (560)	88.00% (580)
Colorado State Patrol	7.64% (42)	7.00% (42)	7.00% (42)
Selective Traffic Enforcement Division of Highway Safety	1.44% (0)*	1.50% (15)**	1.50% (15)
Department of Corrections	1.89% (33)	2.00% (43)	2.00% (55)
AJCC Programming	.40% (8)	.50% (8)	.50% (8)
Non-Law Enforcement Agencies	.74% (7)	1.00% (7)	1.00% (10)

NOTE - Figures in ( ) denote number of terminals.

*   Selective Traffic Enforcement System utilized CCIC terminals.

** Highway Safety to purchase terminals for STEP/MIS.

2 of 4

ON-LINE PROCESSING USAGE

- Expressed in Total Systems Units of Processing (SUP) and Percent of
  Total Used

	Actual 1981-82	Estimated 1982-83	Projected 1983-84
Colorado Bureau of Investigation	29,910,036 88.29%.	32,081,250 88.50%	34,326,938 88.50%
Department of Corrections	640,465 1.89%	725,000 2.00%	775,750 2.00%
Colorado State Patrol	2,588,970 7.64%	2,537,500 7.00%	2,715,125 7.00%
Division of Highway Safety	487,974 1.44%	543,750 1.50%	581,812 1.5%
Non-Law Enforcement	250,764 .74%	362,500 1.00%	387,875 1.00%
Total SUP Used	33,878,209	36,250,000	38,787,500
Total SUP Available	126,144,000	126,144,000	126,144,000
Percent Used	26.86%	28.74%	30.75%

A System Unit of Processing (SUP) is equivalent to one second of computer
processing.

3 of 4

BATCH PROCESSING USAGE

   - Expressed in Total System Units of Processing (SUP) and Percent of Total Used.

	Actual 1981-82	Estimated 1982-83	Projected 1983-84
Colorado Bureau of Investigation	11,473,402 49.85%	11,084,400 45.00%	11,860,200 45.00%
Department of Corrections	3,838,848 16.68%	4,433,760 18.00%	4,744,080 18.00%
Colorado State Patrol	4,696,526 20.40%	3,941,120 16.00%	4,216,960 16.00%
Division of Highway Safety	1,961,302 8.52%	2,955,840 12.00%	3,162,720 12.00%
Division of Property Taxation	373,224 1.62%	985,280 4.00%	1,054,240 4.00%
Division of Local Government	179,452 .78%	246,320 1.00%	263,560 1.00%
Department of Local Affairs(SAC)	495,916 2.15%	985,280 4.00%	1,054,240 4.00%
Total SUP Used	23,018,670	24,632,000	26,356,000
Total SUP Available	126,144,000	126,144,000	126,144,000
Percent Used	18.25%	19,53%	20.89%

A System Unit of Processing (SUP) is equivalent to one second of computer processing.

Disk Storage by User Agencies   4 of 4
        (Expressed in Disk Storage Tracks Used - 1 Track = 1792 Characters)

	Actual 1981-82	Estimated 1982-83	Projected 1983-84
Computer Operating System	106,442	113,000	121,000
Working Storage Requirements	92,500	99,000	106,000
Colorado Crime Information System	199,429	226,000	446,000
Department of Corrections	61,550	72,000	77,000
Division of Highway Safety	40,021	47,000	50,000
Colorado State Patrol	28,825	34,000	36,000
Division of Local Government	749	38,000	41,000
Division of Property Taxation	3,579	3,800	4,000
Department of Local Affairs	3,360	3,600	4,000
(Include Statistical Analysis Center)			
CBI Laboratory System (New 1981-82)	22,529	55,000	59,000
Total Tracks Used/Projected	558,984	691,400	944,000
Total Tracks Available (18 Drives)	666,000	666,000	666,000
Total Tracks Available Growth	107,016	(25,400)	(278,000)

Estimated 1982-83

    7% Growth + Test Data Base Implementation - 31,000 Tracks.
              (CCIC - 13,000 Tracks; DOC - 6,000 Tracks; STLP - 4,000 Tracks
              CSP - 3,000 Tracks; CBI/LAB - 5,000 Tracks.)
            + Division of Local Government - 37,000 Tracks for Census Data
            + CBI/LAB - 25,000 Tracks for full year operation.

Projected 1983-84

    7% Growth + CCIC - 130,000 Tracks for Redundant Files; UCR, CCH, and
              "HOT" Files.
            + CCIC - 74,000 Tracks for Transfer of License Registration
              and Drivers License Files from Department of Revenue.

A major concern has always been to maintain the communications services to State law enforcement agencies at a high level. The backup power supply has helped greatly. The growth in usage and number of terminals threatens to saturate the network this year, and exceed its capacity next year. To meet this demand AJCC will request funds to upgrade line speeds to 4800 bits per second from 2400, and to upgrade the communications controllers to handle the traffic. A budget increase is also needed to cover the higher tariffs that will take effect in April, 1983. One new position will be requested to monitor the communications network.

Systems support is now running at 15,696 hours, plus a 1,560 hour increase in demand in 1982-83, plus a backlog of 4,400 hours for a total of 21,656 hours of system requirements. This converts to a workload for 12.5 FTE, for the staff of 10. Two more programmers will be requested to maintain and enhance existing systems, which are:

1. Colorado Crime Information Center:

   a. Hot Files and Criminal History
      - Wanted Persons
      - Stolen Articles
      - Worthless Documents
      - Vehicles
      - License Plates
      - Boats

   b. Uniform Crime Reporting

   c. Message Switching (CCIC to NCIC & NLETS)

2. CBI:

   a. Forensic Laboratory Case Management

3. Colorado Law Enforcement Training Academy (CLETA):

   a. School System - student records

4. Colorado Crime Check:

   a. Property Index System

5. Division of Highway Safety:

    a. STEP/MIS - Selective Traffic Enforcement Program

6. Colorado State Patrol:

    a. CSP/MIS

7. Department of Corrections:

    a. Offender Based Tracking System
    b. Inmate Banking System

8. Division of Property Taxation

    a. Property Valuation
    b. Cost Table Calculation
    c. Cost Manual
    d. Alpha Codes
    e. Sales File Build
    f. Sales Ratio (SPSS)
    g. Short Sales
    h. Cost Estimating Worksheet Calculations
    i. Cost Estimating Worksheet Update and Change
    j. Sales Analysis Data
    k. Vehicle Fleet Maintenance Management (from CSP)

9. Local Affairs - Administrative Section

    a. FTE Tracking
    b. Statistical Analysis (SPSS)

Planned Enhancements and New Applications:

1. CCIC:

    Enhancements

    a. AJCC - GGCC Interface - to access Corporations files
    b. Data Base Evaluation/Redesign (ongoing)
    c. Message Switching - using front-end processor
    d. Processor Modifications - as needed

<u>New</u>

    e. Motor Vehicle Data Base - copies from Revenue (1.0 FTE)
    f. Automated Fingerprint Filing
    g. Un-Numbered Property

2. CBI:

    a. PROMIS Interface - post dispositions from laboratory system

3. Highway Safety:

    a. STEP/MIS - add communities as funded

4. Department of Corrections

<u>Enhancements</u>

    a. MAPPER - user-friendly programming package
    b. Medical Alert - collection and reporting
    c. Time Computation - expansion to include policies

<u>New</u>

    d. Access Law Enforcement Data
    e. Event Indexing
    f. Food Services (MAPPER)
    g. Vehicle Maintenance (MAPPER)

5. Division of Property Taxation:

<u>Enhancements</u>

    a. Public Utilities - apportionment of property between counties
    b. Annual Report - allow for fiscal impact studies on proposed
                      legislation
    c. Sales Analysis - merge existing systems
    d. Exemption - analyze annual statements on exempt property

<u>New</u>

    e. Agricultural Land Valuation Calculation - valuation by earning
        or productive capacity

One new computer operator will be required to handle the growth in batch production processing and report generation.

Additional equipment and software requested for 1983-84 includes:

1. 8434 Dual Disk Drive - for proposed transfer of vehicle and Driver's License files to AJCC from Revenue,

2. Three 8434's and disk controller - for redundent files,

3. Two DCP/40 communications processors to replace existing CSP's,

4. Ten UTS/20 terminals, printers, and modems for new users,

5. AJCC-GGCC computer to computer interface,

6. MAPPER - user friendly programming language,

7. Data Scope/Test Analyzer - communications test/monitoring equipment.

PLAN OVERVIEW

DEPARTMENT OF NATURAL RESOURCES

Long-range plans call for the integration of data systems using data networks and compatible hardware/software. Users will become more involved as they use microcomputers, software packages, and user friendly languages to meet many requirements without the aid of data processing specialists. Existing systems will serve as the base for expansion. Large processing requirements will continue to be met at CSU, CU and GGCC.

Projected new and revised applications, excluding those only requiring normal maintenance are:

Application (New) (Revised)	Schedule	Resources
Budget Accting (N)	7/82 - 12/82	GGCC, 1 FTE Dev.
Natural Areas (N)	12/82- 9/83	Mini/CSU-Contract SW
Reference Point Tracking (R)	9/82 - 2/83	
Mailing Labels (N)	2/84 - 4/84	Wang OIS
Sportsman Data Base (N)	3/83 - 3/84	Wang VS/GGCC, 2 FTE
State Lands (N)	2/83 - 12/83	Wang VS, Contract SW
Ground Water (R)	7/83 - 6/84	Wang VS, 1 FTE

Application (New) (Revised)	Schedule	Resource
Dam Safety (N)	7/83 - 4/84	Wang VS/CSU, 1 FTE
Oil & Gas Prod. Acctg. (N)	7/82 - 3/83	Wang VS/GGCC, Contract SW
Boat/Snowmobile Reg. Online (N)	12/84 - 6/85	Wang VS, Contract SW
Parks Resource Acctg. and Modeling (N)	7/83 - 12/83	Wang, VS, Contract SW
Mined Land Info. Sys. (N)	9/83 - 5/84	Wang VS, Contract SW
Data Management Sys. (N)	1/84 - 2/85	Wang, VS/GGCC/CSU, Contract SW
Office Automation (N)	9/83 - 12/83	Wang VS/OIS
Distrib. Data Network (N)	11/83 - 12/84	Wang VS/2200, 8 micro, Contract SW

PLAN OVERVIEW

DEPARTMENT OF PERSONNEL

The purchased Applicant Data System package will be operational in the Spring of 1983. It will replace obsolete exam application and scoring systems. Statistical Package for the Social Sciences (SPSS) at the General Government Computer Center has replaced similar processing at CU.

Several modifications to the Personnel Data System (PDS) will be necessary for implementation of Senate Bill 308 to allow for an Incentive Pay System, Performance Appraisal System, and a Training Record System. The Department is also participating in the planning for a revised Central Payroll System.

The 1983-84 plans call for enhancement of the Skill and Performance Data Bank, and creation of a Task Analysis Data Bank. The latter is essential to automation of the classification system. An estimated 1.5 FTE in additional systems development support is being requested for GGCC systems. Two terminals will be added to complete the planned configuration for the Department. Agency terminals for access to PDS are expected to total about 50. They will be included in plans and budgets for each agency.

PLAN OVERVIEW

DEPARTMENT OF REGULATORY AGENICES

This department's overall goals and objectives remain unchanged:

1. Centralized Licensing System - to provide a comprehensive on-line system to process 80,000 new licenses and renewals per year.

2. Complaint Tracking Systems - to provide for the accumulation of statistics for management and reporting.

3. Banking Analysis - to have staff capability to analyze data processing procedures and accuracy of data in individual banks.

4. Electrical Permit System - to establish an on-line system for issuance of permits and storage of inspection data.

5. Cash Funding Fee Schedule - to assist the agency in yearly adjusting of fees.

6. Position Cost Accounting - to allow tracking of personnel costs by position and accurate computing of POTS.

The ADP systems objectives are to:

1. Streamline and coordinate processing.

2. Achieve economies in processing, storing, and retrieving data.

3. Provide statistical analysis and reporting as needed.

4. Elminiate cumbersome manual processing.

5. Provide greater administrative support and free staff for policy and technical issues.

6. Reduce fragmentation of understanding and improve communication through common centralized computer systems.

7. Provide better service to the public with quicker access to more current and accurate data.

The department took over development of the Electrical Permit System from the contractor, who failed to deliver an acceptable system, and completed it. This delayed other work.

The department has installed word processing equipment in PUC, Securities, and Registrations. The central system will eventually serve the whole department and tie into data bases at GGCC.

The projected workload anticipates no new positions. Enhancements and new systems are planned in the following areas:

1. Centralized Licensing Systems

    General Exam Processing
    Board by Board conversion, ongoing

2. Insurance Licensing

    Mark IV - COBOL/PL 1 Conversion

3. Voucher System

4. Word Processing Support and Expansion

5. PUC analysis and support programs

New terminals will be added as needed.

PLAN OVERVIEW

DEPARTMENT OF REVENUE

This department has been involved with implementation of recommendations from the Revenue Data Processing Task Force Study, Volume III, 1980 ADP Master Plan. Conversion to the MVS operating system, CICS teleprocessing monitor, VTAM file access method and the upgrade of the communications controller will be completed this year. This has imposed a heavy burden of personnel training.

There is a backlog of projects of up to 36 months. Most involve more on-line operations and less batch type of processing.

Video 370 is being eliminated in favor of key-disk, which will gradually be replaced by other on-line processing. The creation of the Pueblo Data Entry Center moves 29.3 FTE from West 6th Avenue to that city. The department's steering committee sets priorities for the various projects.

New applications fall into three categories:

1. Business Tax System/Accounts Receivable - will incorporate all taxes and fees collected by the Department of Revenue except Individual Income Tax.

2. Distributive Data Processing for Motor Vehicle Division - will require legislation to provide an automated system for all county clerks. Minicomputers and terminals would be provided to counties without computers of their own.

3. Resource Planning Projects - is a collection of 11 projects, eight scheduled for the near future, which will involve more on-line processing to eliminate bottlenecks and enhance production processing in all areas.

As new systems put pressure on the prime shift processing, concerns grow for how long the IBM 3031 can support the user base. One FTE has been assigned to perform ongoing capacity planning to measure computer utilization and project future requirements. The major tool will be the IBM USAGE (Understanding your System and Application Growth Environment) methodology. A major problem is the lack of space for future upgrades in the present location.

PLAN OVERVIEW

DEPARTMENT OF SOCIAL SERVICES

Fiscal year 1982 saw some major changes that have had a ripple effect on long-range plans and scheduled implementations:

1. Omnibus Reconciliation Act of 1981 (PL97-35) - mandated major changes to AFDC effective 10/1/81. Most were implemented 12/1/81, with cleanup into 1982. Personnel were diverted to this project from COIN. The COIN project was delayed, plus some completed work had to be revised to reflect the new law.

1983 STATE OF COLORADO ADP MASTER PLAN

2. Accounting - was transferred from a Burroughs L-9000 to an IBM
    8100 with enhanced features. The 8100 was also to be used for
    COIN development, but proved to be a bottleneck. A dedicated
    COIN 8100 has since been acquired.

3. Section 1634 of Social Security Act - allows Health and Human
    Services (HHS) to determine medical eligibility for recipients
    of SSI payments. This caused major revisions to the State Data
    Exchange (SDX) and Buy-In systems.

4. Low-income Energy Assistance Program (LEAP) - was changed so
    much that over 50% of the programs had to be rewritten.

The long range plan calls for eventual integration of all public
assistance programs into one integrated service delivery system, the Client
Oriented Information Network, or COIN. The concept will be basically complete
by FY 1984-85. Principal program areas are: (1) Aid to Families with Dependent
Children (AFDC), (2) State supplements to Supplemental Security Income (SSI),
(3) Food Assistance, (4) Medical Assistance, and (5) reporting of County
General Assistance payments.

In the short range the following new systems are under way:

1. Food Assistance - using the New Mexico system and facilities
    under contract, will bring Colorado into compliance with Federal
    regulations. This system is not compatible with COIN.

2. Child Welfare Eligibility and Systems Tracking (CWEST) - is the
    management information system for children and their families in
    program areas IV, V, and VI. It will track children in and out
    of foster care, services designated as alternatives to foster
    care and adoption. Seven components of the system are foster
    care, payrolls, budget reconciliation, management reports,
    adoption, outcome measures, and tracking.

3. Child Support Enforcement - is designed to replace the old system
    as a permanent subsystem of COIN. It will be developed in
    cooperation with the Judicial Branch, and has been approved for
    Federal funding.

In addition, two more areas are marked for new systems:

1. Service to the Aging - would be a COIN module to completely replace the old system, which has many problems and is not useful for program management.

2. Veterans Affairs - would automate the present manual system. Not dependent on that system, a small computer for the Colorado State Veteran's Nursing Home is also planned.

Maintenance and enhancements are planned to continue for the following systems:

1. Financial and Medical Eligibility (AP-700)

2. Foster Care System (FCS-100)

3. Accounting

4. Day Care Payroll

5. Social Services (AFCS-101)

6. Vocational Rehabilitation

7. Donated Foods

8. Child Abuse Registry

9. Merit Personnel

10. Day Care Licensing

11. Buy-In

In the Office of Information Systems, plans are being made to improve support services by both OIS and GGCC in the following areas:

1. ADP Billing System - a new enhanced system to meet the needs of program area billing.

2. Communications Center - a location to house the growing maze of communication equipment.

3. Toll-Free Telephones - to provide easy access to the COIN Help Desk from counties.

4. Project Rooms - common user work areas for system users.

5. Office Automation - a concerted effort to plan for increased word processing support in every division and office in the department.

6. Office Space - to adequately house growing OIS staff.

Lastly, and of paramount importance, is the need for GGCC to provide processing and storage capabilities to support these plans. That has been the basis for all planning, scheduling, and approvals for Federal funding of development.

PLAN OVERVIEW

DEPARTMENT OF STATE

This department depends on the General Government Computer Center for support of four main applications.

1. Corporations - the registration of all companies doing business in Colorado.

2. Uniform Commerical Code - the filings and related information designed to secure the safety and legality of commercial documents and transactions, and make them available to the filing parties, legal jurisdictions and the public.

3. Elections - a file of all registered voters in the State.

4. Notary - the registration of all notaries public in the State.

The department is connected to the IBM 3033 at GGCC by two private communications lines, operating at speeds of 4800 bits per second. The lines are connected to three Harris controllers, which operate 20 interactive terminals and four printers. Because it deals directly with the public, increasing the processing capabilities and eliminating downtime are of highest priority to the Department.

The 1983-84 plan calls for enhancements to the Corporations and UCC applications, conversion to on-line data entry for Elections, and a new Accounts Receivable system for the Cashier's Office if a current study shows it feasible.

To implement the plan the following resources are being requested:

1. Terminals - 5 additional

2. Communications - increase line speed from 4800 to 9600 BPS

3. Staffing - 1 FTE, to handle job scheduling, troubleshooting, and any data processing communications with GGCC. This would free State's one programmer to concentrate on programming and documentation.

SECTION VI

HIGHER EDUCATION PLANS OVERVIEW

INTRODUCTION

The plans summarized and presented here were submitted to the Division of ADP for approval. They have been condensed as faithfully as possible without any intent to change their original meaning. Inclusion here does not indicate approval, nor does an accidental omission indicate disapproval. Such approval or disapproval will be conveyed by direct communication with each institution in the normal process of coordination. Exceptions with statewide policy implications or major importance are included as part of Section IV, Conclusions and Recommendations.

PLAN OVERVIEW

ARAPAHOE COMMUNITY COLLEGE

Arapahoe Community College (ACC) has a new president, and is changing from a quarterly to a semester instructional program. Changes are planned in both the instructional and administrative areas.

The Computer Science Program has offered around 20 sections of programming classes with 25 students each. Students have used the DEC 11/44. Advanced students have used the IBM 3033 at GGCC for COBOL classes.

This year the Business Division is implementing a new program, titled Management Information Systems, with both programming and system type classes. The programming courses are supported by a microcomputer lab of some 7 to 12 Apple computers. The lab will also be used for development of word processing and office systems.

Computer Aided Instruction has the most potential for increase, and will make use of all the equipment, with an expected heavy use of graphics and pre-packaged software.

The Administrative Data Processing area, which has shared the DEC 11/44, will install a new DEC VAX 11/750 and begin to phase out the Data 100 RJE terminal. Application development continues to support the stated goals of 1) expansion of an institutional data base to include more elements of usable data from a larger segment of the College, and 2) development of more comprehensive and usable management reporting.

Most applications are processed at GGCC on the IBM 3033, except for the on-line registration system which is a distributive system on the DEC computer under the POISE software package.

Applications presently being developed (1982-83) are:

NEW

      Accounts Receivable - study for package, or do in-house,
      Data Entry - transfer from key-disk to DEC mini,
      Student Parking - track parking tickets.

CONTINUING

      Student Data Base - Grades - expand to include complete
                             record on-line, and generate grade
                             mailers.

                      - Transcripts - change to semester, and
                        produce complete transcripts.

      On-Line Reports - Various reports for Student Services and
                         Institutional Research.

      Personnel System - Modify to interface with State system, or
                        possibly implement under POISE.

     ACC expects to establish a 3-5 year ADP Master Plan for both
administrative and instructional computing.

<div align="center">PLAN OVERVIEW</div>

COMMUNITY COLLEGE OF DENVER

     CCD's data processing plan is intended to support both operational
and managerial functions. Most of the planned application enhancements are
aimed at solving operational problems by different reports, or by reducing
the paperwork and logistics involved in preparing input. The exception is
the Institutional Research enhancements, which are intended to summarize and
integrate student, accounting and personnel data for decision making pur-
poses. The new development applications are aimed at supporting functional
organizations at the operational level not previously supported. Enhance-
ments and new applications are listed below:

<div align="center">1983   STATE OF COLORADO   **ADP MASTER PLAN**</div>

ENHANCEMENTS TO ADMINISTRATIVE AND INSTRUCTIONAL SYSTEMS

A. Accounts Receivable

　　1. Pick up payment data from DEC registration process.
　　2. Provide capability for assisting the add/drop process.

B. Accounts Payable

　　1. Install the standard HEFAS DEC front end.
　　2. Convert to standard HEFAS edit/update.

C. Financial Aid

　　1. Redesign interface to HEFAS Accounts Payable and Management
　　　 Reporting System.
　　2. Replace update program.

D. Management Reporting

　　1. Expand use of attributes for program expenditure
　　　 reporting.
　　2. Complete the implementation of all specialized reports.
　　3. Facilitate the use of the system by the Budget Office.
　　4. Install the standard HEFAS DEC front end.
　　5. Convert to standard HEFAS edit/update.

E. Institutional Research

　　1. Develop files and report generators for historical trend
　　　 analysis.

F. Personnel

　　1. Add-on capability to prepare contracts.
　　2. Provide automatic interface to State of Colorado classified
　　　 personnel system.

G. Property Control

　　1. Requires major rewrite due to increasing control require-
　　　 ments.

H. Registration

1. Add enhanced capability for handling drop/adds.
2. Add capability to span files in inquiries.

I. Instruction in the Data Processing Field

1. Enrich software available.
2. Diminish student waiting time.

J. Instruction Using the Computer

1. Provide equipment and personnel to stimulate use by all
    faculty.

NEW DEVELOPMENT - ADMINISTRATIVE APPLICATIONS

A. Advisory/Graduation Assessment (1982-83) - New

The system will provide an inventory of instructional pro-
grams, course requirements, and compare student progress
toward graduation.

B. Course Master (1982-83) - Replacement

This new system will incorporate controls necessary to manage
curriculum by use of recently instituted curriculum committee
structure.

C. Financial Aid (1982-83) - Replacement

This system will interface directly with the accounts payable
and general ledger systems, and eliminate existing subsystems
which provide interface.

D. Room Scheduling (1983-84) - New

To manage classroom and conference room space, this system will
inventory space, make or change assignments, and make periodic
reports.

E. Personnel (1984-85) - Replacement

A new system using data base or an alternative that will pro-
vide ad hoc reports without heavy programmer workload.

F. Library Circulation (1984-85) - New

Acquire a package or join a consortium to automate libraries
at North, Red Rocks and Aurora Campuses.

Planned enhancements to administrative and instructional systems
will require machine resources at GGCC. The requirements are outlined below:

Budget Year 1982-83

o Connection for three CRT's added to Community Service offices.
o Connection for a DEC 11/44 located at the Aurora Education Center.
o Machine time to support a 25% increase in student instruction.
o Machine time and disk space to support a 5% increase in student
   enrollment. Disk space will be 5% more than currently used.

Beyond Budget Year 1982-83

o Connection for a DEC 11/44 located at CCD Central Administration.
o Connection for three System 6's located at each campus.
o Connection for additional direct access CRT's and printer capa-
   bility for campus registrar and business office.
o Machine time and disk space to support a 5% per year enrollment
   growth.
o Connection for a DEC 11/34 located at Pueblo Vocational Community
   College.

Machine time and jobs processed are expected to increase by about
5% over current usage. Disk space requirements are projected to increase by
10 cylinders in 1982-83, and by 20 cylinders in later years.

The projected personnel requirements are shown on the CCD organiza-
tional chart. (Exhibit VI-A)) The communications network requirements are
projected on the CCD-GGCC Line/Terminal Description Chart. (Exhibit VI-B)
Both charts are reproduced on the following pages.

PROJECTED   EXHIBIT VI-A

ORGANIZATIONAL CHART
COMMUNITY COLLEGE OF DENVER

CONTRACTUAL	CLASSIFIED

	CONTRACTUAL	CLASSIFIED
ADMINISTRATIVE	1	2
OPERATIONS		9
SYSTEMS 7 PROGRAM-MING		8
EDUCATIONAL SVS.		9
	1	28 = 29
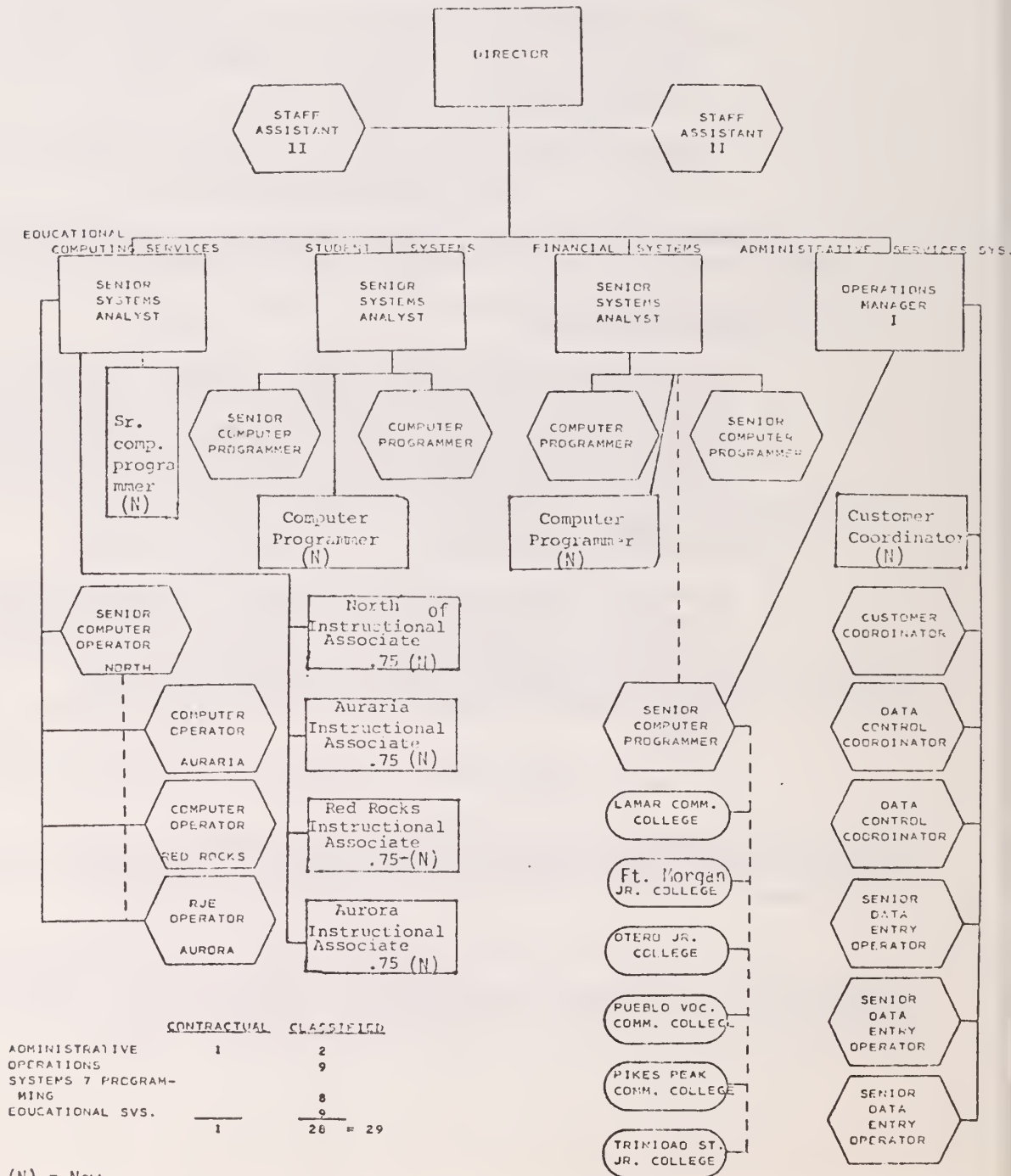
(N) = New

EXHIBIT VI-B

COMMUNITY COLLEGE OF DENVER -
GENERAL GOVERNMENT COMPUTER CENTER
LINE/TERMINAL DESCRIPTION CHART
(projected)
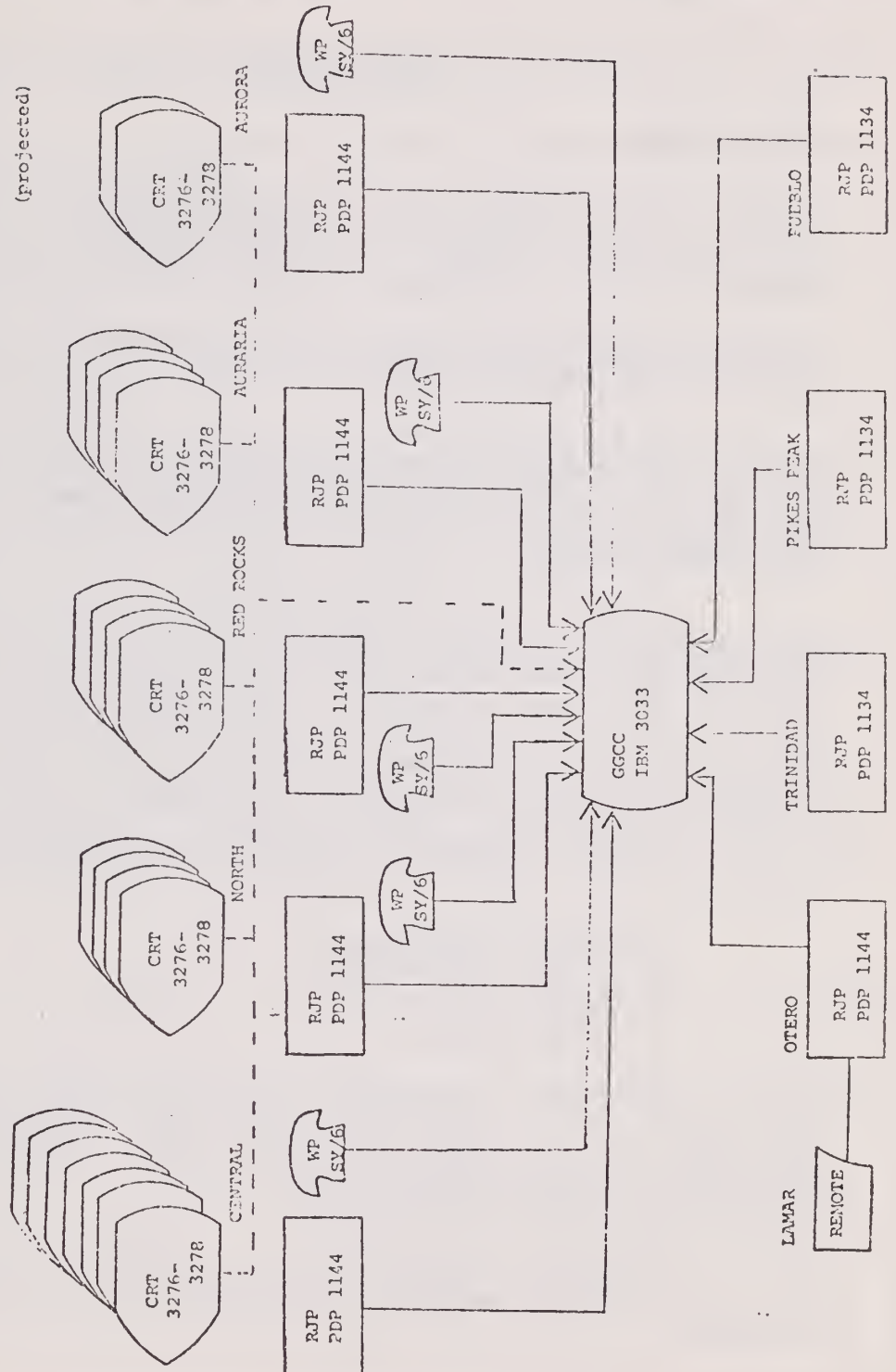
PLAN OVERVIEW

MESA COLLEGE

Mesa College has the long-range objective of increasing the use of computers in the academic area to train all students at the introductory level, and provide expanded training for those interested in data processing, computer science, and computer related careers.

In the administrative area more automated systems, and enhancement of existing systems are planned.

In August, 1979, Mesa installed a Digital PDP 11/70 minicomputer, and has since redesigned and reprogrammed all systems formerly processed on the IBM 360. The PDP 11/70 systems are mostly interactive and card punching has been eliminated except for classroom demonstration. The original objectives have been met.

The PDP 11/70 has all communication ports in use, so that no more terminals can be attached. There are 30 academic terminals, 25 administrative terminals, two faculty terminals, and two remote. However, as a direct result of the change in hardware, student enrollment (computer accounts assigned) has risen from 140 in the Spring of 1979 to 880 in the Spring of 1982. Over 1,000 are expected in the Fall of 1982. The 55 to 1 ratio of students to terminals is far below the acceptable level.

Further development is needed in the following administrative systems:

1. Fiscal System
2. Student Information
3. Payroll
4. Financial Aid

The college is currently developing a master plan to re-establish the computer center as the communication link, incorporating all aspects of data processing (ie., Computer Services, Office Information Systems, Printing, Publications, Communications, Phones, Mail, etc.). The plan will outline development over the next 3-5 years.

To meet the immediate need for more terminals and computer resources the college proposes expansion of the DEC system by adding a second processor, a VAX 750.

To coordinate academic systems development the college will request an Academic Computer Coordinator position.

To maintain the administrative systems being developed, another programmer position is being requested.

PLAN OVERVIEW

METROPOLITAN STATE COLLEGE

Metropolitan State College is the third largest higher education institution in the State, with approximately 16,351 students and a budget of about 38.5 million dollars.

The administrative support systems are processed at GGCC, over three communication lines. The lines support a remote job entry terminal with four key-disc stations, an IBM 3274 control unit with 32 terminal capacity, and an IBM 3271 control unit with 16 terminal capacity. At present there are 36 CRT display terminals and four printers installed.

The academic computing center is based upon a Hewlett-Packard HP3000 minicomputer that is linked by a communication line to the IBM 370/148 at the University of Northern Colorado.

The administrative systems were studied by Touche Ross and Co. in November, 1977 and were recommended for replacement by new systems using modern processing techniques. A data base steering committee was established to help analyze needs. Aprpoximately 700 data items have been identified. A sequence of systems to be revised and replaced has been established.

Title	Target Dates	Comments
Faculty & Staff Personnel System	Jul-Dec 1982	Interfaces or feeds PDS
Financial Management System Tuition Collection/Cash Receipts	Jul-Sep 1982	Interfaces with HEFAS
Receipt for NDSL, Student Nursing Loans	Sep 82-Jul 84	Interfaces with HEFAS
Receipts for Budget Sub-Ledgers	Sep 82-Jul 84	Interfaces with HEFAS

Title	Target Dates	Comments
Summarized Receipts	Sep 82-Jul 84	Interfaces with HEFAS
General Ledger, Budget and Financial Reporting Systems	July 1983	Implement HEFAS
Accounts Payable	July 1983	Implement HEFAS
Payroll System	Oct 83-Jul 84	Interfaces with CMIS
Property Control System	Jul 84-Jul 85	
Student Financial Aid System	Jul 83-Jul 84	

The new systems will use ADABAS (Adapatable Data Base Systems) software at GGCC where appropriate. Existing Student Information systems that were originally designed to run under IBM's IMS (Information Management System) and were converted to ADABAS might take less processing time if they were redesigned. However, this will not be done unless additional personnel become available.

The Financial Aid System will be evaluated this year for possible replacement by a system from another institution, or it will be redesigned under ADABAS.

New applications that will be given conceptual analysis this year are:

1. Simulation/Modeling - projection of enrollments for planning.

2. Community Agency Information - a catalog of agencies related to MSC programs in the Metro area, by name and service.

3. Special Programs - enrollees and performance indicators for non-credit producing programs.

4. Physical Education Facility Scheduling File - replace manual system.

5. Expendable Supplies Inventory File - purchasing subsystems.

The MSC master plan proposes that a new mainframe computer be installed at MSC to support the applications now running at GGCC and UNC. This concept is called a "Replicated Distributed Data Base Configuration". By definition this calls for replacement of files, software, and hardware at the user (MSC) site. For costing purposes an IBM 4341 was assumed to be capable of providing adequate support, at least initially. The following benefits are presented under this proposal.

1. Improved Service - eliminates much communication and pickup/ delivery to GGCC.

2. Frees resources at GGCC and UNC for use by others.

3. Provides emergency backup for other State agencies using IBM hardware and compatible software.

4. MSC would have management responsibility for all its services.

5. Reduces communication line costs.

6. Reduces the cost of providing services at GGCC.

The academic computer center includes:

1. HP 3000 Minicomputer, with data lines to Civil Engineering, Electrical Engineering Technology, School of Business, Economics, and Math Department.

2. Two CRT rooms with 20 interactive terminals.

3. Eight dial-up lines for remote terminals with acoustic coupler.

4. Satellite Center in West Classroom and Arts Building, with 4 inter-active terminals, and two workstations for the Micom word processor.

5. 2nd Satellite Center in the Math Department, room 128 of the Science Building, with two graphics terminals and two CRT's.

6. Dial-up capability to University of Colorado for special applications

Computer utilization data shows 70%-80% utilization of interactive terminals, and response time of 60-90 seconds. The communication link to UNC is operated at about 85% utilization.

Handicapped students can access the computer from the West Classroom satellite center. MSC is acquiring a Talking CRT for use by a blind student.

In 1983-84 two additional satellite centers will be established in the Schools of Education and Professional Studies. In addition, ways will be explored to incorporate video terminal operations directly into the classroom, both by use of the CRT's directly, and by use of a converter to use the TV-audio system of the Auraria Media Center.

In 1984-85 a major upgrade to the computer system will be required, with an additional central processor, about 2 megabytes of memory, 400 megabytes of disk storage, and a network of microcomputer based workstations.

New applications are anticipated for:

1. Aerospace Sciences Dept. - solution of air navigation problems.

2. Hospitality, Meeting, Travel Administration Dept. - airline reservations, hotel reservations, travel agency ticket processing and accounting.

3. Industrial Communications - word processing and possible computer terminal interface.

4. Industrial Education - College graphics, photo-typesetting.

5. Mathematics Dept. - microcomputer/terminals and Basic/Fortran/Pascal capability and interface to HP3000 computer.

6. Earth Science Dept. - Digitizer for use with graphics workstation.

7. Chemistry Dept. - Intelligent terminals with graphics and instrumentation interface, plotter or graphics printer, CRT's.

8. School of Education - microcomputer/terminals and Basic/Fortran/
Pascal capability, and HP3000 interface, serial printer, letter
quality printer.

The academic center currently operates 84 hours per week with only
one full-time person assigned. The director is a faculty member with a half-
time release. Students working part-time man the computer center the remainder
of the time. To efficiently operate the center MSC will request the following
additional staffing:

1. One full-time director
2. One software programmer
3. One full time operator

The long range plan is to meet the following real demands for
computing resources:

1. A growing need by Colorado citizens for education in basic
computer skills.

2. An increasing demand for computer skills in non-computer areas
such as hotel, travel, reservation, and convention planning.

3. A general feeling by program directors that all students should
have an acquaintance with computers as part of today's world.

4. Rapid advances in the incorporation of word processing with
traditional data processing.

5. The growing need to use computers in creative teaching techniques
such as the TIPS program used by the Economics Department.

PLAN OVERVIEW

OTERO JUNIOR COLLEGE

Otero has on-site Digital PDP 11/44 - PDP 11/34 processors, with a communication line to GGCC and the Higher Education Financial Accounting System (HEFAS) used by all State junior colleges. Lamar Community College shares the system via 8 terminals multiplexed over a second line connecting the two colleges. Both institutions use HEFAS.

Long-range plans call for keeping pace with current technology and increasing the computer access and use by increasing the number of terminals available, and providing more applications for user departments.

The following diagram, taken from the OJC ADP Master Plan, shows the educational uses planned for investigation and implementation where possible.

COMPUTER CENTER ADP PLANS - OTERO JUNIOR COLLEGE
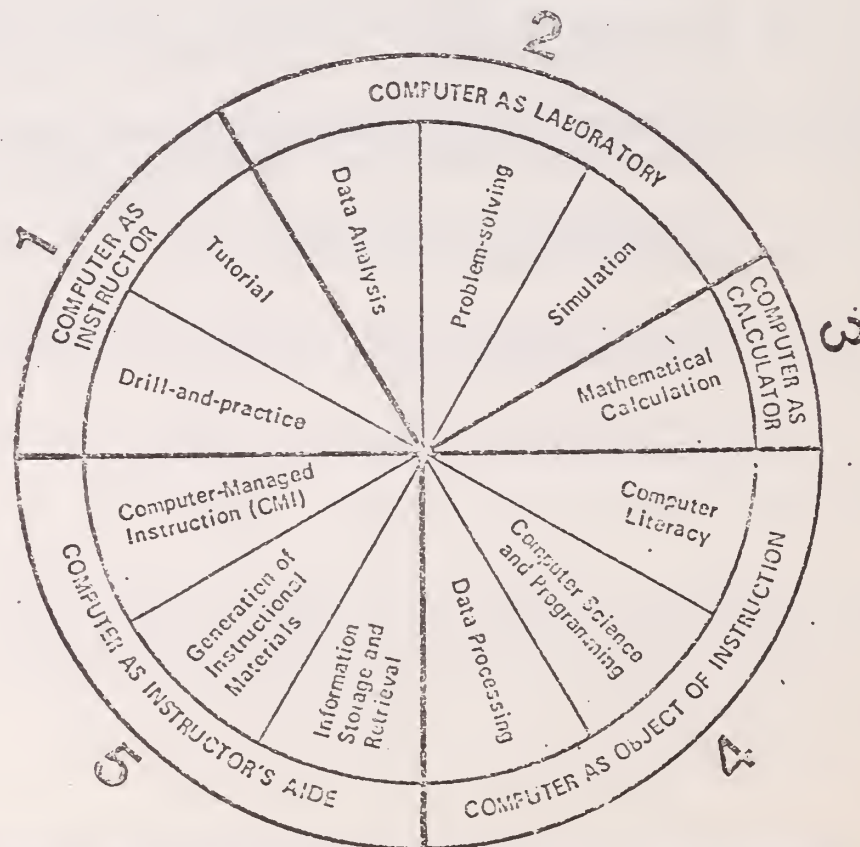
We also recognize the fact that this does not exhaust all the uses of a computer. At the present time only section 4 is being actively utilized.

Applications in current use include the following:

a) Student Records - On-line registration to grade reporting and production of required reports for State and federal agencies.

b) Payroll - All necessary reports, to the actual writing of payroll checks.

c) Accounts Receivable - A general purpose system to handle all phases of the college A/R needs.

d) Financial Aid - System handles the activity and reporting needs to process the financial aid funds.

e) Job Corps - System designed to track student progress for Job Corps coordinator.

f) Veteran's Benefits - System captures necessary data for reporting to Veteran's Affairs.

g) Other small user-development systems.

Planned Enhancements include:

a) Interface of Subsystems to HEFAS - Payroll, Accounts Receivable, Financial Aid.

b) Implement Student Record/Registration System for Lamar in 1982-83.

New applications to be investigated as time permits include:

a) Word Processing

b) Computer Aided - Computer Managed Instruction (CAI/CMI).

To support this plan the 1983-84 budget request will include:

a) 1.0 FTE in the computer area.

b) Upgrade PDP 11/44 memory, 256KB,

1983 **ADP MASTER PLAN**

c) Add 36" plotter to PDP 11/44 for surveying, architectural,
    and engineering students.

d) Upgrade terminals to add graphics capabilty for departments
    such as engineering and business.

PLAN OVERVIEW

TRINIDAD STATE JUNIOR COLLEGE

Trinidad State Junior College is oriented to serve users of data
processing in both instructional and administrative areas. A rapid growth of
interactive computing is expected in the instructional area. A wide applica-
tion of transaction data capture and shared files is expected in the adminis-
trative area. A complete revision of manuals, procedures, and course catalogs
will be required.

The DEC PDP 11/44 computer serves both instructional and administra-
tive requirements. It has replaced the IBM 1401 and the CDC UT 200 terminal.
It is connected by communication line to GGCC in Denver for running the Higher
Education Financial Accounting System (HEFAS).

The college president has established an ADP/computing planning and
control committee to oversee the ADP operation, set priorities, control
projects, establish procedures, and monitor progress of the computer center.

The number of jobs scheduled has risen from 22,000 in 1979-80 to
46,000 in 1981-82. It is expected that there will be a need to expand the
hours of operation of the center, and additional personnel will be necessary.
More terminals and more storage of data do not seem compatible with this
computer configuration. A study will focus on the growth in computing needs.

Short Term objectives:

1. Provide instructional departments with more computer time.

2. Make facilities available from 8 to 12 hours daily.

3. Research software packages available to faculty to aid in
    computer-aided instruction.

4. Additional courses offered to a wider variety of departments.

5. Establish written user documentation for:

    a. computer use,
    b. computer-aided instruction,
    c. Colorado Career Information System (COCIS)
    d. Higher Education Financial Accounting System (HEFAS),
    e. On-line Registration System,
    f. Administrative Reporting.

Long Range objectives:

1. Develop or implement an Accounts Receivable System.

2. Develop or implement a Financial Aid Accounting System.

3. Develop or obtain a Library System.

4. Work with the State Board to develop and implement information
    exchange procedures and to utilize output from these programs.

1983:

1. Reorganize all files and accounts.

2. Provide menu driven programs for all users.

3. Interface data between all users for sharing, to stop repitition.

4. Complete the conversion of the last four 1401 programs to the
    DEC computer.

5. Provide proper schedules for all users and jobs (this will include
    expanded hours).

6. Investigate word processing needs and requirements, and submit
    proposal for approval.

7. Install dial-up communications for extended capabilities and
    better hours of utilization.

8. Replace COBOL with WATBOL for system improvement.

1984:

1. Install a plotter for engineering students and drafting students (as required by State Board).

2. Begin replacement of ADM 3 terminals with graphic terminals to enhance terminal capabilities.

Due to the rapid change in technology, it is difficult to plan beyond a three-year period. TSJC believes in the importance of a changing and continuing curriculum for students, and will need to provide adequate computer service to all users, since computer concepts are valuable not only in business but in family and social situations, as well.

New job descriptions published by "Infosystems" 1982, project a need to revise all teaching on a yearly basis. Compefax, Dec. 1981, shows that by 1980, computer employement will increase 173 percent.

Trinidad State Junior College has just completed their long-range process plan, and Data Processing has become a major area in the plan.

PLAN OVERVIEW

UNIVERSITY OF COLORADO (ACADEMIC)

The University of Colorado plan of 1981-85 is still valid. As part of the implementation phase an outline plan of the 30 month period from February, 1982 to July, 1984 for the University Computing Center is summarized below:

Short term objectives

-- Provide adequate computing levels (central systems)
-- Lay foundation for expansion of computing literacy requirements
    - networking
    - public access areas
    - broad spectrum of offerings, especially micros

-- Address specialized needs
    - Engineering - Graphics, CAD/CAM
    - Computer Assisted Instructions (CAI).

Implementation

-- Present Status
  - Cyber 720, VAX 11/780, asynchronous network, public terminal areas, general purpose graphics; 2nd VAX, more terminals, network equipment, some micros.

-- 1982-83
  - 3rd VAX, 100 terminals, 25 micros, communications equipment

-- 1983-84
  - 4th VAX, 100 terminals, 50 micros, communications equipment, large shared disk facility.

-- 1985...
  - Enhance scientific mainframe.

Enhanced Computing Literacy & Research Capability

-- Maintain status quo, and be compatible with added requirements for literacy, research.

-- Preconditions to planning for literacy, research
  - Intensive planning by faculty, administration
  - Commitment to significant increase to capital, base computing budget
  - Appropriate curriculum changes

-- Probable areas of investment, 1983-88
  - Major graphics facility/facilities
  - CAD/CAM
  - CAI
  - Micro proliferation
    o 1 per instructor
    o 1 per graduate student, certain disciplines
    o establish ratio for undergraduates
    o requires extensive support facilities, network, staff, space
  - telecommunications network
    o link academic, administrative, and others
  - other linkages, audio-visual, public cable, advanced CAI, other computing networks

-- Organizational and management issues
- location of academic computing in administration
- responsibilities for telecommunications networking
- balance between centralization, decentralization, distribution
  of computing resources
- education of faculty
- initiation of modified curriculum

Plan for Long Range Planning

-- Subcommittees already at work

-- Executive Committee formed

-- Relationship between executive goals and faculty planning

-- Timeframes

-- Approved segments (graphics, CAI, etc.) will be added to intermin
   plan budgets for enhanced literacy, research as they complete
   planning cycle. First impact 1983-84.

PLAN OVERVIEW

UNIVERSITY OF SOUTHERN COLORADO

The USC plan of 1980-85 is still valid. The academic computing
function has taken a giant step forward with the selection and installation
of a dedicated Prime computer system consisting of a model 750 and a model
780. The IBM 370/145 will continue to serve the administrative function for
the near future.

The short-term requirements will see the need for add-on disks,
terminals, and other peripherals as the needs grow and new courses and/or
applications use the computers.

Projected academic requirements were determined by extending the
base on a three-level growth pattern. Low (Pessimistic), High (Optimistic)
and Intermediate (Median). If conditions are favorable, but not perfect, the
actual need will likely fall somewhere between the Intermediate and High
estimates. The Applied Science and Engineering Technology (ASET) applications
will continue to be the biggest user. The High and Intermediate Projections
taken from the 1980-85 plan (Exhibit VI-C) and the Computer Using (Applica-
tion) Courses (Exhibit VI-D), are reproduced on the following pages.

Academic Computing Plan - U.S.C.

EXHIBIT VI-C
Page 1 of 2

Appendix A.14 - Predicted Academic Computing at U.S.C.
1984-85, High Estimate

Data: Annual Terminal Hours

School	Base (1)	Add Applications (2)	Adjusted for Enrollment Objectives (3)
ASET	6,760		9,230
Applications		4,200	5,740
Business	1,360		1,620
Applications		4,200	5,020
Science-Math	2,580		3,010
Other	340		360
Sub Total	11,040	8,400	24,980
Faculty (4)			10,000
Research (5)			6,250
Computer "Literacy" Training (6)			2,980
Computer "Familiarity" Training (7)			1,190
Total Terminal Hours			45,400
Terminals (8)			87 Terminals

See Detail, Appendix A.13
  (1) Per Appendix A.5
  (2) Per Appendix A.10:   4 X .19 X 11,040 = 8,400 Terminal
                                                        Hour:
  (3) Per Appendix A.12:   Enrollment Objectives, by School
  (4) Per Appendix A.10
  (5) Estimated: .25 X 24,980 = 6,250 Terminal Hours
  (6) Per Appendix A.12:   1984-85 Total Enrollment = 4,756
                            1984-85 Computer Using
                               Departments = 2,375
        (.75 X 4,756) - 2,375 X 10 = 11,920 Hours over 4 Years
                                      2,980 Hours Per Year
  (7) (.95 X 4,756) - (.75 X 4,756) X 5 = 4,760 Hours over
                                                        4 Years
                            1,190 Hours Per Year

Academic Computing Plan - U.S.C.

EXHIBIT VI-C
Page 2 of 2

Appendix A.15 - Predicted Academic Computing at U.S.C.
1984-85, Intermediate Estimate

Data: Annual Terminal Hours

School	Base (1)	Add Applications (2)	Adjusted for Enrollment Objectives (3)
ASET	6,760		9,230
Applications		2,100	2,870
Business	1,360		1,620
Applications		2,100	2,510
Science-Math	2,580		3,010
Other	340		360
Sub Total	11,040	4,200	19,600
Faculty (4)			7,840
Total Terminal Hours			27,440
Terminals (5)			53 Terminals

See Detail, Appendix A.13
  (1) Per Appendix A.5
  (2) Per Appendix A.10: 2 X .19 X 11,040 = 4,200 Terminal
                                             Hours
  (3) Per Appendix A.12: Enrollment Objectives, by School
  (4) Per Appendix A.10
  (5) Per Appendix A.13

Academic Computing Plan - U.S.C.

EXHIBIT VI-D

Appendix A.16 - Predicted Academic Computing at U.S.C.
        Computer Using (Application) Courses

School			Course Title	Actual 79-80	Est 80-81	Total Students
ASET	CST	115	Operating Systems I	58		58
	CST	240	Systems Analysis I	23		23
	EN	341	Engineering Economy	48		48
	CST	330	Program Languages		15	15
	CST	341	Systems Design II		30	30
	CST	350	Data Base Mgt.		30	30
	CST	416	Operating Systems II		15	15
	CST	420	Data Structures		30	30
	CST	490	Projects in Comp Sci		30	30
Business	ACCTG	401	Advanced Acctg	35		35
	ACCTG	430	Accounting Info Sys	35		35
	MANG	260	Bus Statistics I	201		201
	MANG	261	Bus Statistics II	111		111
	MANG	330	Corp Finance	104		104
	MANG	331	Financial Mgmt	12		12
	MANG	333	Investment Analysis	18		18
	MANG	362	Systems Analysis	19		19
	MANG	460	Computer Resources	16		16
	MANG	465	Operations Research	6		6
	MANG	467	Computer Simulation	7		7
	MANG	469	Advanced Computer	16		16
	MARK	440	Marketing Research	13		13
Math-Sci	MATH	156	Intro Statistics	91		91
	MATH	244	Operations Research	15		15
	MATH	256	Prob and Statistics	18		18
	MATH	342	Numerical Analysis	15		15
	MATH	253	Data Analysis		30	30
	MATH	343	Num Diff Equations		30	30
	MATH	243	Math Modeling		25	25
			Total	861	235	1096

Independent and Advanced Study		
ASET	57	57
Business	53	53
Math-Science	28	28
Total	138	138

APPENDIX A

AGENCY AND COMPUTER CENTER ADP PLANS

Introduction

       In the past, each agency planned, almost independently, for its own ADP support. More coordinated planning among an agency and its supporting computer centers is increasingly appropriate, with the agencies and centers submitting the plans to the Division of ADP.

       The Division of ADP requires an ADP plan from all departments, agencies or institutions who use or plan to use ADP resources. The agencies' long-range (3-5 years) plans must be received by April 1 and should contain the information indicated in the section entitled "Format for Agency Plans". If an agency's plan has not changed since the previous year, agencies are asked to submit a status report on previous year's plan with a cover letter describing the situation. The Division of ADP then provides appropriate agency plans and coordinating instructions to the manager of each supporting center. Subsequently each supporting center is required to submit a center plan. The computer center plan should contain the information indicated in the Section entitled "Format for Computer Center Plans", and must be provided to the Division of ADP by June 15. Agencies and computer centers are asked to submit more detailed short-range plans with priority listings and budget request data by August 1, of each year. Short-range plans will reflect the current year appropriation and new items to be requested in the next fiscal year.

       The objectives of the above schedule are:

1. To allow for adequate planning and dissemination of agency and computer center plans prior to preparation of budget requests.

2. To provide time to the Division of ADP to formulate the ADP Master Plan and budget recommendations for the Governor, the Office of State Planning and Budgeting and the Joint Budget Committee.

       Without agency and center plans, it would be inappropriate to expect budgetary support or equipment and personnel acquisition support from the Division of ADP.

FORMAT FOR AGENCY PLANS

        SECTION I: Management Summary

        SECTION II: Current Status (Current Fiscal Year)

                o Description of current applications by: supporting State computer center, on-site processor, or contract support facilities.

        oo FTE requirements for maintenance (to keep applications running)

    o Description of current data communication requirements.

    o Problems

SECTION III: <u>Planned Enhancements to Current Applications (By Fiscal Year) 198x-xx</u>

    o Description and justification

        oo Description of reports to be added/deleted

        oo Estimated transaction volume change

    o Schedule/Dates

        oo Development

        oo Test

        oo Operational

    o Resource requirements (By Fiscal Year)

        oo FTE to design/program changes

        oo Other (i.e., purchased software, etc.)

        oo Additional file storage requirements

        oo Estimated affect on current data communication requirements

    o Recommendations to supporting computing facility to provide for the planned enhancements.

SECTION IV: <u>Planned New and/or Replacement Applications (By Fiscal Year) 198x-xx</u>

    o Description and justification

        oo Decription of reports/programs to be added and/or replaced

        oo Estimated transaction volume change

        o Schedule/dates

           oo Development

           oo Test

           oo Operational

        o Resource requirements (By Fiscal Year)

           oo FTE to design/program, etc.

           oo Other (i.e., purchased software, etc.)

           oo Additional file storage requirements

           oo Data communications requirements

        o Recommendations to supporting computing facility to provide for new/replacement application.

SECTION V: Resource Requirements (By Fiscal Year) 198x-xx

        o Personnel

           1. An organizational chart of the agency's ADP function showing numbers of personnel by job classification.

           2. New requirements that will be requested in next budget request.

           3. Special education or training required.

           4. Projected requirements (beyond the next budget request) and the estimated fiscal years of the requirements.

        o Hardware

           1. Additional on-site equipment (including terminals) to be requested in the agency's next budget request, and justification.

2. Recommended additions that might be budgeted
by computer centers for support of the agency.
(NOTE: No list of current equipment is re-
quired if the agency has reviewed and updated
the inventory provided by the Division of ADP.)

o Software

1. Software required but not available to the
agency either on-site or at the supporting
computer. Location(s) where the software is
required.

o Communications

1. Additional or changing communication lines
and modem requirements.

o Other Special Requirements

SECTION VI: <u>Benefits</u>

o A description of the benefits, savings, and cost
avoidance that are to be realized as a result of
implementing this agency plan.

SECTION VII: <u>Other Recommendations</u>

o Any specific recommendations to the Division of
ADP or supporting computer centers that may
improve the agency's ADP function or support of
the agency.

<u>FORMAT FOR COMPUTER CENTER PLANS</u>

SECTION I: <u>Management Summary</u>

SECTION II: <u>Current Status</u> (Current Fiscal Year)

o Description of current applications, by agency,
that are supported by the center.

o Current equipment inventory

o Current utilization (Use illustration shown in
Section VI)

o   Current data communications schematic(s)

o   Problems

SECTION III: Workload

o   Applications, by agency, requiring additional
    support

o   Other enhancements required that are not related
    directly to   specific applications; e.g., normal
    growth, technological change, etc.

o   Impact on resources

SECTION IV: Short-term (priority) Requirements (Current Year)

o   Agencies and their applications that justify the
    priority

SECTION V: Resource Requirements (By Fiscal Year) 198x-xx

o   Personnel

    1.   An organization chart of the computer center
         showing the number of personnel by job classi-
         fication.

    2.   New requirements that will be requested in
         next budget request.

    3.   Special education or training required.

o   Hardware

    1.   Additional equipment (including terminals)
         to be requested in next budget request, and
         justification.

o   Software

    1.   Recommended software changes.

o Communications

   1. Additional or changing communications lines
       and modems.

o Facilities

   1. Comments on adequacy of existing facilities

   2. Recommended changes

o Other resources

SECTION VI: Hardware Utilization (By Fiscal Year)

The current and projected utilization of computer
resources should be shown for the current and each
future year covered by the plan. Include resource
requirements for:

1. Current needs

2. Anticipated growth (volume)

3. New and revised applications

All requirements are measured against existing
capacity for each resource shown. Resources
should include such components as: CPU cycles,
disk storage capability, memory capacity, and
channel availability.

The following chart should be completed for each
of the five planning or projected years. The
chart is an example of the resources which should
be included.

The resources which should be included will vary
depending upon computer configurations and applica-
tions.

DESCRIPTION	CPU	MEMORY	DISK ACCESS CHANNEL 1	DISK STORAGE	TAPE ACCESS CHANNEL 2	PRINTER
Current	75	100	80	160	50	50
Growth	10	10	20	30	0	5
New	10	10	10	10	0	5
TOTAL	95	120	110	200	50	60
Capacity	90	90	50	85	50	90
Excess or Deficiency	(5)	(30)	(60)	(115)	0	30

Figures are percent of full capacity

SECTION VII: Benefits

 o A description of specific benefits, savings, and
  cost avoidance to be sought during the budget year.

SECTION VIII: Other Recommendations

 o Any specific recommendations to the Division of
  ADP

AGENCIES REQUIRED TO SUBMIT ADP AGENCY PLANS

All departments, agencies, or institutions who either currently
use or plan to use automated data processing (including word processing)
in the conduct of their business.

COMPUTER CENTERS REQUIRED TO SUBMIT ADP COMPUTER CENTER PLANS

General Government

Revenue

Administration of Justice

Labor/Employment

University of Colorado

Colorado State University

APPENDIX B

PUEBLO DATA ENTRY CENTER POLICY AND PROCEDURE

STATE OF COLORADO

DIVISION OF AUTOMATED DATA PROCESSING
Department of Administration

1575 Sherman Street, Room 110
Denver, Colorado 80203
Phone (303) 866-2641

July 23, 1982

Richard D. Lamm
Governor

R. Garrett Mitchell,
Executive Director

Robert J. Miller
Director

ADP MANAGEMENT MANUAL
POLICY STATEMENT UPDATE

Attached hereto is a policy statement concerning the new Data Entry Center in Pueblo, Colorado.

Add the policy statement to Volume One, Section V, at the proper page designation.

Retain this update cover sheet at the end of the final section in the manual.

DEPARTMENT OF ADMINISTRATION
DIVISION OF AUTOMATED DATA PROCESSING

AUTOMATED DATA PROCESSING **MANAGEMENT** **MANUAL**	ISSUED 7/2/82	REVISED	VOLUME ONE	SECTION V	PAGE 0419
	VOLUME ADP ADMINISTRATION				
	SECTION POLICY STATEMENT PUEBLO DATA ENTRY CENTER				

A. <u>PURPOSE</u>

To incorporate into the State of Colorado Automated Data Processing Management Manual the policy and procedures necessary to implement Executive Order D004-82 effective July 1, 1982, regarding the utilization of the Pueblo Data Entry Center.

B. <u>SCOPE</u>

Distribution made to:

o All Departments, Agencies, and Institutions

o All ADP Activities

o All Computer Centers

o Archives

C. <u>APPLICABILITY</u>

This policy statement is applicable to all State departments, agencies, and institutions.

D. <u>CROSS-REFERENCE</u>

The Executive Order precipitating this Policy Statement is contained in Volume One, Section IV, page 0207.

E. <u>POLICY</u>

It is the policy of the Division of ADP that all State Departments, Agencies, and Institutions shall utilize the services of the Pueblo Data Entry Center to the maximum degree possible.

New data entry positions, or the services of outside data entry contractors, shall not be obtained without the approval of the Executive Director, Department of Administration, acting through the Director of the Division of ADP. Each State Department, Agency, or Institution must provide the Division of ADP with justification as to why the Pueblo Data Entry Center is not adequate to meet their needs prior to any approval for creation of new data entry positions or use of outside contractors for data entry services.

DEPARTMENT OF ADMINISTRATION
DIVISION OF AUTOMATED DATA PROCESSING

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	SECTION POLICY STATEMENT PUEBLO DATA ENTRY CENTER				

Implementation of this policy shall not be made in such a way as to adversely affect the efficient, effective, and economical operation of State Agencies, Departments, and Institutions.

F. AMPLIFICATION

The Pueblo Data Entry Center shall be the primary source of data entry services for State Government. It will provide the most modern and cost effective equipment and techniques. The organization will function under the direction and control of the Department of Administration as an auxiliary or business enterprise. It will be supported entirely from cash funds received from user agencies for its services. The Division of ADP will work with the center, the Office of State Planning and Budgeting, the Legislature, and the State Controller to plan and implement the conversion from the current General/Cash funding method.

The Pueblo Data Entry Center will operate out of a revolving fund with authority to expand or reduce operations to meet demands, and with the ability to obtain loans from the State Treasurer in advance of revenues (CRS 24-75-203 rev.) in order that the Center may respond quickly and effectively to the needs of all State agencies, and be competitive with similar service organizations in the private sector.

The Center will initially serve agencies at the Department of Revenue and General Government Computer Center, and will extend services to all other agencies as soon as such services can be made available.

The Center may provide or obtain services of benefit to its users which include, but are not necessarily limited to, the following:

1. Collection and distribution of source documents and output records or media.

2. Communication facilities to computer centers and/or user agencies.

3. Programming services to create and maintain efficient, economical data conversion programs.

4. Consultation services to assist in developing cost effective data entry systems.

5. Optional data conversion services such as optical scanning or diskette to magnetic tape.

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DIVISION OF AUTOMATED DATA PROCESSING

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The Center will be permitted to set variable rates in order to encourage off-hours use, longer lead times, and to collect a surcharge for difficult work due to illegible documents or poorly designed systems.

The Center should operate more than one shift in order to provide maximum service to users, and to make maximum utilization of the equipment.

The Center will be permitted to use outside contractors if that is necessary to meet peak load demands. Individual agencies may not use outside contractors without the approval of the Executive Director, Department of Administration, acting through the Department of the Division of ADP. Approval will be required for each and every instance of use.

Each and every instance of use shall be interpreted as one or more of the following:

1. <u>One-Time Job</u> - A special, non-recurring data creation or file conversion with a specific volume and time limit which shall not be exceeded.

2. <u>Special Project</u> - A special non-recurring data entry requirement directly connected with a larger data processing project, and contracted for as part of a total package.

3. <u>Overload</u> - Permanent or recurring jobs normally processed by the Center, which the Center chooses not to accept due to other commitments which make resources unavailable. In this instance the Center will set the limit or extent to which the agency may use outside contractors directly. This should normally be limited to specific batches, and in no case shall exceed one week in duration. Should the condition persist a new approval will be required each succeeding week. Permanent overload conditions should be eliminated by increased capacity and/or productivity of the Center.

4. <u>Grandfather Applications</u> - Applications normally processed for State agencies by outside contractors will be allowed to continue through December 31, 1982. Each State agency must then submit to the Division of ADP a plan for the transfer of the data entry function to the Pueblo Center or request an exemption. For exemptions to be approved the agency must show that a transfer to the Center would adversely affect the efficient, effective and economical operation of the system, and be unworkable and unacceptable.

B-5

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DIVISION OF AUTOMATED DATA PROCESSING

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VOLUME	ADP ADMINISTRATION

SECTION	POLICY STATEMENT PUEBLO DATA ENTRY CENTER

G. **PROCEDURES**

The intent to this policy statement is that all procedures, these and any forthcoming, be so designed as to give the Pueblo Center the right of first refusal of work.

To implement this policy statement the following procedures are hereby established:

I. **NEW APPLICATIONS**

   1. **Service Request** - Before any data entry services can be acquired from outside the Center, a Request for Data Entry Services (Exhibit A) must be submitted to the Pueblo Data Entry Center.

   2. **Center Review** - The Center will review the Request and take one of the following actions:

      a. Accept the request, unconditionally -

         (1) Center and Requesting Agency then work together to implement the application and/or perform the work.

      b. Accept the request, with conditions -

         (1) The Requesting Agency may meet the conditions and work with the Center to implement the application, OR

         (2) The Requesting Agency may seek approval from the Division of ADP to:

            (a) Create data entry capabilities in-house, OR

            (b) Acquire data entry services from other sources.

      c. Reject the Request -

         (1) Temporarily - indicating when service can be provided or intent to be able to provide service, OR

         (2) Indefinitely - indicating fully why services cannot be provided, THEN

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DIVISION OF AUTOMATED DATA PROCESSING

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(3) The Requesting Agency may seek approval from the Division of ADP to:

   (a) Create data entry capabilities in-house, <u>OR</u>

   (b) Acquire data entry services from other sources.

3. <u>Division of ADP Review</u> - DADP will review all Requests for Services, and the action taken by the Center. DADP will require that adequate documentation be submitted by the Requesting Agency in support of their request to create their own data entry operation or to use outside contractors. As a result of the review, one of the following actions will be taken:

   a. The Requesting Agency will be granted their request unconditionally to:

      (1) Create in-house data entry capabilities, <u>OR</u>

      (2) Use outside data entry contractors.

   b. The Requesting Agency will be given limited approval to use in-house data entry or outside contractors ONLY UNTIL THE PUEBLO CENTER CAN PROVIDE THE NEEDED SERVICES.

   c. The Request will be denied, and the Requesting Agency will:

      (1) Revise their request for services so that the Pueblo Center <u>can</u> provide their data entry needs, <u>OR</u>

      (2) Abandon the system as unworkable.

   d. The Division of ADP, in cooperation with the Center and the Requesting Agency, will develop a mutually acceptable plan to meet the needs of all parties.

A file of all Requests for Service including those accepted by the Pueblo Center will be kept by DADP for at least two years.

II. <u>PREEXISTING APPLICATIONS</u>

Since it is not possible to staff for all peak load conditions, but timely response to user needs is essential, the Pueblo Data Entry Center must establish procedures to accomplish the following:

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DIVISION OF AUTOMATED DATA PROCESSING

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AUTOMATED DATA PROCESSING

MANAGEMENT MANUAL

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1. <u>Automatic Overload</u> - Accept normal overload work and distribute it to outside contractors without any intervention required by the user agency. This should be used for small and infrequent overloads not readily foreseen.

   A monthly report on the amount of such work performed outside must be submitted to the Division of ADP each month.

2. <u>Seasonal Overloads</u> - Heavy volumes that can be foreseen should be planned for in advance, and temporary and/or part-time employees, and additional equipment if necessary, should be pro- vided for such seasonal periods. These needs must be documented and submitted to the Division of ADP in advance for approval.

3. <u>Agency Managed Overloads</u> - When the Pueblo Center cannot reason- ably expect to meet regular peak load demands, it may grant per- mission to the user agency to deal directly with an outside contractor. When this is done, the following conditions must be met:

   a. The terms and conditions of this arrangement must be put in writing and submitted to the Division of ADP for approval.

   b. The outside contractor must be selected in accordance with all pertinent purchasing rules and regulations.

   c. A monthly report of the amount of such work performed out- side must be submitted to the Division of ADP each month.

H. <u>STANDARDS</u>

In order to provide prompt, efficient, and cost effective service to State agencies, and be competitive with private service organizations, the Pueblo Data Entry Center will be expected to meet high standards of performance. The Pueblo Center will establish internal standards and procedures to meet this requirement, and submit them to the Division of ADP for approval.

Such standards and procedures should include, but not be limited to the following:

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DIVISION OF AUTOMATED DATA PROCESSING

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1. <u>Training</u> - Standards of proficiency, and training programs designed to meet those standards, should be established to insure that competent and productive data entry personnel are developed and retained. New employees should be trained on the vendor's equipment used by the center, in accordance with the Center's and the vendor's accepted practices.

2. <u>Scheduling</u> - Standards and procedures for accepting, scheduling, and monitoring of work in progress should be developed so that user deadlines can be met.

3. <u>Billing/Receivables</u> - An accurate, fast and effective billing system needs to be established to maximize cash recovery and minimize "float". Billings should reflect all variable rates, and be readily understandable by the user. Where possible, inter-agency vouchers should be triggered automatically.

4. <u>Security</u> - Standards and procedures should be developed that will assure the security, confidentiality, and integrity of the information processed, and protect against physical disaster.

5. <u>Planning</u> - A procedure for developing an annual plan for the Pueblo Center should be established to assure that it will be able to respond to user needs now and in the future. The plan will be submitted to the Division of ADP for approval in accordance with the usual requirements for computer center facilities.

I. <u>REPORTING</u>

Monthly reports to DADP of the amount of data entry work provided by outside contractors to the Pueblo Center and to State agencies directly must include the following:

1. Job or Application identification
2. Source or Supplier
3. Keystroke count billed
4. Keystroke payment
5. Other charges, if any
6. Total payment
7. Total all applications for Agency -

   a. Keystrokes
   b. Keystroke Payment
   c. Other Charges
   d. Total Payments for the Month

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DIVISION OF AUTOMATED DATA PROCESSING

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J. **LIMITATIONS**

This policy will not apply to Colleges and Universities that have their own data entry facilities. However, they are encouraged to use the Pueblo Center when necessary or desirable to do so.

K. **EFFECTIVE DATE**

This policy will become effective July 1, 1982, and remain in force unless modified or rescinded.

EXHIBIT A

PUEBLO DATA ENTRY CENTER
REQUEST FOR DATA ENTRY SERVICES

I.   REQUESTOR:

Requesting Agency:_____Request No.:_____

Contact Person:_____Title:_____Phone:_____

Authorized By:_____Title:_____Date:_____

II. JOB DESCRIPTION:

One Time: (   )   Special Project: (   )   New: (   )

Overload: (   )   Period/Work Covered:_____

Job Name or ID:_____Related Request:_____

Work Description:

III. JUSTIFICATION/REMARKS:

IV. PUEBLO DATA ENTRY CENTER:

Approved   (   )   Conditions/Limitations_____

_____

Rejected Indefinitely   (   )   Temporarily   (   ) Comments:_____

_____

By:_____Title:_____Date:_____

V.   DIVISION OF ADP:

No Action Required: (   )   Approved, In-house(   )

Approved, Contractor   (   )   Comments:_____

_____

By:_____Title:_____Date:_____

EXHIBIT A

INSTRUCTIONS FOR PREPARING
REQUEST FOR DATA ENTRY SERVICES
FROM PUEBLO DATA ENTRY CENTER

A. GENERAL

The request form is a typewriter form. It is designed to be copied (xeroxed)
as shown, and filled in on the typewriter. Preprinted forms may be supplied
at a later date. If insufficient space is available for some elements,
attach additional sheets, keeping the form as a cover sheet for signature.

B. EFFECTIVE DATE

Agencies should begin to use the form for new applications requirements
immediately, even though the PUEBLO DATA ENTRY CENTER (PDEC) is not yet
operational. Initially agencies should submit the form to:

> Don Borgman, Manager of Operations
> General Government Computer Center
> 2002 So. Colorado Boulevard
> Denver, Colorado 80222   Phone 759-1221, Ext. 249

Agencies will be notified by GGCC/PDEC of change in this address. Questions
should be directed to the above.

C. COPIES

Three sets are to be submitted:

1. PDEC copy
2. DADP copy
3. REQUESTOR copy, to be returned after processing has been completed.

D. NUMBERING

Request Number (upper right hand corner) will be inserted by PDEC, and will be
the control number of the request.

E. REQUESTOR'S SECTIONS

Except for the Request Number element, the requestor will complete sections I,
II, and III as follows:

SECTION I REQUESTOR:

1. Requesting Agency - The agency name, followed by the Controller's
    six digit code for that agency. The code is needed to assure correct
    billing by PDEC. It, and the date authorized can be used to cross
    reference to the Request Number.

2. Contact Person, Title, Phone - This line will tell PDEC and Division
    of Automated Data Processing (DADP) who to contact concerning the
    request or work to be done under it.

3. <u>Authorized By, Title, Date</u> - This line will be completed by the person in the requesting agency with the authority to approve the expenditure of funds for the service requested.

SECTION II JOB DESCRIPTION:

1. Only one box should be checked:

   a. <u>One time</u> - Non-recurring, with a specific time or volume of work, to be identified in <u>Period/Work Covered</u>.

   b. <u>Special Project</u> - Non-recurring work that is part of a larger data processing contract or project for which the agency is seeking approval to include the work as part of an overall package. Additional information will be provided in <u>Period/Work Covered</u> and <u>Justification/Remarks</u>.

   c. <u>New</u> - Work of an ongoing nature not previously performed by PDEC. <u>Period/Work Covered</u> would normally be Indefinite/Volume and frequency.

   d. <u>Overload</u> - Work PDEC is unable to accept due to lack of resources. The requestor has previously been informed of this, and is re-questing approval to seek other services for the <u>Period/Work Covered</u>.

2. <u>Job Name or ID</u> - A unique identifier of the data entry application, possibly the form number of the source document.

3. <u>Related Requests</u> - Enter the numbers of requests previously processed for the same work (eg. previous overloads), or concurrent requests which are all related (eg. different parts of the same Special Project).

4. <u>Work Description</u> - Describe the work to be performed. Attach source document(s) if available. Attach another sheet if more space is needed.

SECTION III JUSTIFICATION/REMARKS

Enter here the pertinent information to justify the work, and to explain any <u>One time</u>, <u>Special Project</u>, or <u>Overload</u> requests requiring services from sources outside PDEC.

F. <u>PDEC SECTION IV</u>

1. <u>Approval, Conditions/Limitations</u> - PDEC may check the approved box, and insert any conditions or limitations on the request. If none are entered, the approval will be considered unconditional as requested. <u>OR</u>

2. PDEC may check one of the rejection boxes:

   a. <u>Rejected Indefinitely</u> - Work which PDEC cannot provide, and has no plans to provide in the future.

   b. <u>Rejected Temporarily</u> - Work which PDEC cannot provide now, but expects to be able to provide in the future.

3. <u>Comments</u> - PDEC will explain why the work is rejected, and when the work might be provided if the rejection is only temporary.

4. <u>By, Title, Date</u> - This signature line will be completed by the person authorized by PDEC to accept or reject service requests.

G. <u>DADP SECTION V</u>

Division of ADP will review the requests, and the action taken by the Pueblo Data Entry Center and check the appropriate box:

1. <u>No Action Required</u> - If the service request was approved by PDEC, and the requestor agrees to meet any conditions set by PDEC, then no outside services are needed, and thus no action is required.

2. <u>Approved, In-House</u> - DADP may check this box if permission is given to create data entry positions within the requesting agency. The number and type of positions will be entered under <u>Comments</u>.

3. <u>Approved, Contractor</u> - DADP may check this box if permission is given to obtain the service from an outside contractor. Restriction to existing overload contractors under State award, contractor awarded a contract for an overall package of which the service request is a part, or the require- ment that the agency issue an RFP for the work, will be entered under <u>Comments</u>.

4. <u>Comments</u> - DADP will enter the conditions and limitations to be applied in the creation of in-house data entry positions, or in contracting for an outside contractor to perform the work.

5. <u>By, Title, Date</u> - This signature line will be completed by the person authorized by DADP to act on the service requests.

DEPARTMENT OF ADMINISTRATION
DIVISION OF AUTOMATED DATA PROCESSING

AUTOMATED DATA PROCESSING	ISSUED 7/2/82	REVISED	VOLUME ONE	SECTION IV	PAGE 0207
MANAGEMENT MANUAL	VOLUME ADP Administration				
	SECTION Executive Orders				

A. <u>PURPOSE</u>

To incorporate an Executive Order (copy attached) that was issued July 1, 1982 into the Colorodo Automated Data Processing Manual.

The republication of this executive order is a part of an overall effort to assemble relevant directives and policies into the ADP management manual.

B. <u>APPLICABILITY</u>

The attached Executive Order is reissued for the information of all State departments, institutions and agencies.

D0004 82

State of Colorado

EXECUTIVE CHAMBERS
Denver

RICHARD D. LAMM
Governor

EXECUTIVE ORDER

DECENTRALIZATION OF AUTOMATED DATA PROCESSING FACILITIES

WHEREAS, decentralization of state government by relocating appropriate agencies from Denver to other cities throughout Colorado is an important goal of my administration; and

WHEREAS, the 53rd General Assembly declared its support for relocating state agencies from the Capitol complex in Denver to outlying communities; and

WHEREAS, the Legislature and I deem it appropriate to relocate the Automated Data Processing Data Entry Facilities of the Departments of Administration and Revenue from Denver to Pueblo; and

WHEREAS, the Pueblo City Council and the Pueblo Economic Development Corporation have agreed to provide office space sufficient for a data entry center rent free to the State of Colorado for a period of 10 years, with an option to renew at a negotiated rental rate based on fair market value; and

WHEREAS, pursuant to sections 24-30-102, 24-30-603 and 24-30-605, C.R.S. 1973, the Executive Director of the Department of Administration and the Director of the Division of Automated Data Processing are empowered to adopt rules and regulations establishing procedures and standards for management of data processing facilities for all state departments, agencies, and institutions;

NOW, THEREFORE, I, Richard D. Lamm, Governor of the State of Colorado, by virtue of the authority vested in me under the laws of the State of Colorado, DO HEREBY direct that policies and procedures be established to ensure that the Pueblo Data Entry Center be utilized to the maximum degree possible by all State agencies in compliance with the following guidelines:

1. The Pueblo Data Entry Center shall be the primary source of data entry services for state government.

2. New data entry positions for any State agency or institution may not be established without the approval of the Executive Director, Department of Administration.

3. Outside contractors may not be utilized for data entry purposes without the approval of the Executive Director, Department of Administration. Such approval may be given only if sufficient documentation is provided showing that the Pueblo Data Entry Center cannot provide the needed service.

This order shall be effective July 1, 1982.

GIVEN under my hand and the Executive Seal of the State of Colorado, this 19th day of May, A.D., 1982.

Richard D. Lamm
Governor

APPENDIX C

APPLICATION SOFTWARE REQUESTS POLICY AND PROCEDURE

STATE OF COLORADO

DIVISION OF AUTOMATED DATA PROCESSING
Department of Administration

1575 Sherman Street, Room 110
Denver, Colorado 80203
Phone (303) 866-2641

Richard D. Lamm
Governor

R. Garrett Mitchell
Executive Director

Robert J. Miller
Director

September 3, 1982

ADP MANAGEMENT MANUAL
STANDARDS UPDATE

Attached hereto is the ADP Application Procedure for the newly designed
Application Software Request Form (ASR), which is effective immediately.

Add this standard to Volume Three, Section XXIII, at the proper page
designation.

A supply of ASR forms are attached for your initial use. Each agency
should Xerox copies for future use.

If there are any questions regarding this procedure, please contact
Paul Shafer in the Planning Section of the Division of ADP, Room 110,
1575 Sherman Street, Denver, Colorado 80203. Telephone #866-2641.

DEPARTMENT OF ADMINISTRATION
DIVISION OF AUTOMATED DATA PROCESSING

AUTOMATED DATA PROCESSING MANAGEMENT MANUAL	ISSUED 9/15/82	REVISED	VOLUME Three	SECTION XXIII	PAGE 7200
	VOLUME ADP APPLICATION MANAGEMENT				
	SECTION ADP APPLICATION PROCEDURES (ASR)				

I.   PURPOSE

The ADP APPLICATION SOFTWARE REQUEST (ASR) FORM is TO BE USED AS A FORMAL REQUEST document for all proposed new applications, and all applications being considered for major revisions or additions. (Normal and routine maintenance activities do not require the use of this document.)

II.   AUTHORITY

Title 24, Article 30, Part 603(c) requires the Division of ADP to "Review all existing and future ADP applications... and establish priorities for those that are necessary and desirable"..., and part 606..."...nor shall any new application, system or program begin except upon written approval of the Director of the Division of ADP".

III.   SCOPE

Distribution made to:

o All Executive Departments, Institutions and Agencies
o ADP Managers, Users and Keypeople as applicable
o The Legislative Audit Committee
o The Joint Budget Committee

IV.   APPLICABILITY

All Executive Departments, Institutions and Agencies using or contemplating the use of automated data processing and/or word processing equipment in the exercise of their duties are required to comply.

V.   PROCEDURES

General Instructions (the use of the ASR is effective September, 1982)

1. The ADP/Application Software Request form (ASR) will be forwarded (two copies) to:

     Division of ADP, Room 110
     Planning Section
     1575 Sherman Street
     Denver, Colorado 80203

DEPARTMENT OF ADMINISTRATION
DIVISION OF AUTOMATED DATA PROCESSING

AUTOMATED DATA PROCESSING	ISSUED 9/1/82	REVISED	VOLUME Three	SECTION XXIII	PAGE 7201
MANAGEMENT **MANUAL**	VOLUME ADP APPLICATION MANAGEMENT					
	SECTION ADP APPLICATION PROCEDURES (ASR)					

2. The ADP Planning Section will review the information submitted and will notify the requestor in writing of approval or disapproval.

3. Completion of ASR - Complete the ASR form as applicable, and attach all supporting information as required.

   Field A - Requesting Agency

   <u>Requesting Agency</u> - The agency name, and State Controller agency number.
   <u>Host Computer</u> - Type (e.g., IBM 3033)
                     Location (e.g., GGCC, 2002 So. Colo. Blvd.)

   Field B - Request For

   <u>Name of Application</u> - The designated name of the application, e.g., Accounts Receivable.
   <u>New</u> - Check if application is new.
   <u>Revision</u> - Check if a major revision is being made to an existing application.
   <u>Addition</u> - Check if a major addition is being made to an existing application.
   <u>Relation to Existing Application</u> - The relationship which may exist such as Central Accounting System, by the previously mentioned Accounts Receivable application. None if not applicable.

   Field C - Method of Acquisition

   Check the appropriate option(s), and type in applicable information.

   Field D - Software Application

   Check the appropriate type of application, including interactive or batch, and give description, as applicable.

C-4

DEPARTMENT OF ADMINISTRATION
DIVISION OF AUTOMATED DATA PROCESSING

AUTOMATED DATA PROCESSING	ISSUED	REVISED	VOLUME	SECTION	PAGE
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AUTOMATED DATA PROCESSING MANAGEMENT MANUAL

VOLUME
ADP APPLICATION MANAGEMENT

SECTION
ADP APPLICATION PROCEDURES (ASR)

Field E - Funding Data - Check the appropriate option(s), and type in the fund account number.

Field F - Estimated Resources - Provide the applicable information for both development and maintenance items.

Field G - Planning Data -

Life Cycle Time (yrs.), this refers to the estimated life cycle of the application.

Life Cycle Cost ($), this refers to the life cycle cost of the application.

Implementation/Installation Date, refers to the estimated date that the application will be operational.

Field H - Narrative Justification and Benefits

This field is for the agencies to provide the justification for ASR approval, including:

o authorization
o reason/purpose
o cost/benefits, and
o other pertinent information

NOTE: This information must be provided.